THE CONDOR

A Magazine of Western Ornithology

Volume XXI January-February, 1919 Number 1

COOPER ORNITHOLOGICAL CLUB

THE CONDOR

A Magazine of Western Ornithology

Published Bi-Monthly by the Cooper Ornithological Club

Entered as second-class matter February 12, 1908, at the post-office at Los Angeles (Hollywood Station), California, under Act of Congress of March 3, 1879.

Issued from the Office of THE CONDOR, care E. D. Dietz, First National Bank, Hollywood, California

SUBSCRIPTION RATES

Two Dollars per Year in the United States, payable in advance.

Forty Cents the single copy.

Two Dollars and Twenty-five Cents per Year in all other countries in the International Postal Union.

COOPER CLUB DUES

Two Dollars per year for members residing in the United States.

Two Dollars and Twenty-five Cents in all other countries.

Manuscripts for publication, and **Books** and **Papers for Review,** should be sent to the Editor, J. Grinnell, Museum of Vertebrate Zoology, University of California, Berkeley, California.

Claims for missing or imperfect numbers should be made of the Business Manager, as addressed below, within thirty days of date of issue.

Cooper Club Dues, Subscriptions to **The Condor,** and **Exchanges,** should be sent to the Business Manager.

For the **Purchase** of **Back Volumes** of **The Condor** or of the **Pacific Coast Avifauna** series, apply to the Business Manager.

W. LEE CHAMBERS, Business Manager, Eagle Rock, Los Angeles County, California.

Issued *January 28, 1919*

CONTENTS

THE CONDOR
A MAGAZINE OF WESTERN ORNITHOLOGY

Edited by
Joseph Grinnell

Harry S. Swarth
Associate Editor

J. Eugene Law
W. Lee Chambers
Business Managers

Volume XXI
1919

Published Bi-Monthly
by the
Cooper Ornithological Club
Hollywood, California

THE CONDOR

A Bi-Monthly Magazine of
Western Ornithology

Volume XXI | January-February, 1919 | Number 1

[Issued January 28, 1919]

A RETURN TO THE DAKOTA LAKE REGION

By FLORENCE MERRIAM BAILEY

(*Continued from volume XX, page 178*)

V. FROM THE BRIDGE OVER THE COULEE

THE FARMER at whose house I stayed on North Sweetwater offered to take me down the road to the Belgrade Bridge over the Coulee, three miles south, one morning, on his way to town, saying that he almost always saw Ducks in driving across the Bridge, and that they were quite tame, being used to seeing people.

The Coulee was said to meander down across the prairie all the way from Canada, but although that would be only fifty or sixty miles, the map did not fully bear out the statement. At the southern end of its sluggish course it served as a connecting link between the eastern and western lakes of the Sweetwater chain, a few rods west of the Bridge opening into the middle one of the three western lakes, while to the east of the Bridge, by means of interlacing waterways, it completed the chain.

The Bridge, protected by only a narrow hand rail offered an unobstructed view of the narrow Coulee with its bordering cane and marsh grass, that, on the west, wound out past a long point into the lake; on the east, meandering out of sight between high reedy banks. To the north, from horizon to horizon, the view was of prairie grain fields. At the south end of the Bridge, a thicket of willows frequented by Goldfinches made a good screen from which to watch the more wary birds on the water below and to listen to the neighboring songsters. A large cottonwood looking down on the thicket attracted a Baltimore Oriole which might not otherwise have been found there; and when the wind rustled the leaves of the cottonwoods and willows, bringing the fragrance of the wild prairie rose, Song Sparrow, Maryland Yellow-throat, and Yellow Warbler sang blithely, while from the marsh grass beyond came the tinkling *clatter, clatter, clatter* of a Marsh Wren. Meanwhile, Red-winged Blackbirds and other passersby occasionally lit on the Bridge rail for a look about.

A Sora Rail was frequently heard along the marshy border of the Coulee and once when its song came from the high, partly-lodged marsh grass almost under my end of the Bridge, I mechanically whistled the scale after it. Instant response in loud ringing tones surprised me so that, without stopping to think, I craned eagerly forward over the Bridge, projecting my shadow over the marsh—a bad break for an old observer! Again I whistled, but there was no response, and the next song was well down the Coulee. Not until I had recrossed the Bridge on leaving did the loud clear scale come again in the same place, and never on any of my subsequent visits was I able to see that disillusioned Sora.

A few yards from the Sora's hiding ground, one day, I found the Yellow Warblers feeding young. The father of the family, with strong reddish breast streakings flew up into a conspicuous position on a dead willow where he sang loudly, trying to hold my attention while his duller mate, with food in her bill, flew in the direction of small voices down among the roadside weeds. Near the singing station of the Warbler, in a dead bush, two male Cowbirds faced each other, shining, glossy, and respectable looking in spite of their bad family reputation. Going on with an interrupted conversation, perhaps, they pointed their bills skyward, making themselves look very thin and sleek.

Passing Ducks, now a handsome Mallard, Shoveller, or Blue-winged Teal, occasionally dropped into the Coulee, a Black-crowned Night Heron flew over with neck drawn in, a Marsh Hawk pursued by a Redwing hurried by with a flash of white rump and red epaulettes, Black Terns skimmed past, and twittering Barn Swallows with their steely backs and buffy underparts swung around under the Bridge and over the water, in and out and round about.

There were so few passersby on this prairie Bridge ten miles from town that it proved an excellent observation station, and after discovering this, when not engrossed by birds in the sloughs, I came down to take advantage of what it offered. During my visits, at rare intervals I had to pick up my camp stool and shrink back into the willows, once to let some four horse grain wagons pass. Some days no one came to disturb me, and one morning during a two hour vigil only two passersby came, the crippled Rural Route mail carrier with his old white horse and bulging bags and a virile youth whose automobile was heard far across the prairie and who, bare-headed, flashed past full of the enjoyment of racing over the big prairies.

The only foot passengers were a family of pretty young "flicker-tails" which came up from their hole at my end of the Bridge and used the smooth level boulevard as a playground. One touched my foot as he came up through the grass, one day, and then calmly taking his stand about six feet from me where his bright eyes, spotted back, and sandy underparts could clearly be seen, bent over and taking his head in his paws, proceeded with a cat-like bath. While so engaged, a young brother came up, and with a slap of the paw they were off, scampering down the length of the Bridge, tails flickering. On the way back they sobered up enough to stop now and then and stand up on their hind legs, stretching up on tip toe to see better. Once when they had chased noisily down the Bridge past me, one of the pair came back inquisitively, and standing up close in front of me, calmly looked me over.

From the raised platform of the Bridge I looked down on the birds of the Coulee and got delightful hints of family histories unguessed before. In the sloughs, day after day, the gray Coots had run to cover before me, and when

at last by deep wading I had discovered a colony of nests the parents had already disappeared—the slough curtain had been dropped before my face. But from the vantage of the Coulee Bridge, I looked down on the birds pursuing their natural avocations largely unconscious of observation. The relief was so great that coulees, bridges, and high banks became my desiderata for the rest of the season.

Looking down on the Coulee to the west of the Bridge, only about a week after my discovery of the Coots' nests, I saw a gray, white-billed parent Coot swim out from the cane and marsh grass of the opposite bank and start across the water followed one by one by a long file of droll little red-headed, black-bodied young ones like the nestling I had put back among its brother eggs in its nest. With riveted gaze I joyfully counted eight of the swimmers, and afterwards when they recrossed the channel, one more had been added to the brood.

Three days later I was fortunate enough to find what I took to be two parents feeding their brood on the east side of the Coulee. That the two adults were parents of the one brood I inferred from seeing them together before I discovered the young, and finally seeing them all swim about together. When first seen the old Coots were crossing to the marsh vegetation on my side of the Coulee, possibly to see if they might better bring the young across to feed them; but after a few moments both returned, one swimming against the wind with head lowered. The north side of the Coulee was so well lit by the morning sun that I could see the small Red Tops swim through the wind-made arches of marsh grass, and when they were rejoined by their parents and divided into two squads, could watch them being slowly led up and down the edge of the Coulee; now outside, in sight—when I saw a parent dig around at the root of a cane—now in the cane labyrinth hidden from view, while the parents fed them. After working along different beats for a time, the parents led their broods up toward each other, but then as if realizing that it was easier to feed each little group by itself, turned and swam off in opposite directions. One parent who was followed by three young had a nervous air as if new to such responsibilities for little mouths, and led the ducklings along with its quick *pep'*, *pep'*, picking rapidly from the surface of the water, one side and then the other, turning back to let its small followers take the food from its bill.

A week later, on my third visit, I spent an hour and a half at the Bridge watching the Coots feed their young. As before, if my inference were correct, the two parents were taking care of separate squads. This morning instead of picking up tiny water plants from the surface, they got the food mainly under water, sometimes merely putting the head under and making dabs at the weeds, and sometimes diving for them. One parent—the mother, let us say—when followed a yard or two behind by two Red Tops dived and turned around under water coming up facing the other way to meet the laggards. I could see their red sealing wax bills open for the food held out to them. The mother may have been diving deeper than usual, for she would actually hop up out of the water so that her long legs showed, and then, pointing down her bill as a boy puts his hands together in diving from a height, would disappear below. When the bubbles rose over her, the young which had followed her would swim back to the protection of the canes and wait. When she reappeared they would swim out to her or she would swim back to them. Sometimes they would be so near that she merely reached back to them. She once gave one a piece of fila-

mentous water plant that suggested fine green seaweed, and waiting to see if the little fellow could manage it, finally helped him out with it. When one Red Top had had his portion, sometimes another would come up to take his turn, and once two of the quaint little Cootlings came together to swim close to their mother's bill. Several times when fed they dropped part of what she had given them and she had to reach down and pick it up for them. A pretty picture she made when reaching around one by her side to feed him—as if she were putting a motherly arm around him.

But the most interesting thing I saw was when she was diving a few feet out from the bank. Several times as she started away from the brood, one of the small Red Tops climbed up on her back for a ride. When he had gone far enough, she would rise and give a shake, and off he would go; whereupon she would dive and he would swim back to the bank. When both parents started to swim across the Coulee at one time, the rear one had a youngster on his back; and in the same way, when part way across, the small rider was quietly unseated.

The parent which I imagined to be the father—down the canes a few rods—went out and dived several times and when his followers did not appear, ate what he had brought, himself; though later he dutifully hunted them up to feed them. After a time, however, when the mother, if it were she, was diving by the shore, the father, if it were he, swam off alone across the Coulee to take a well-earned rest.

Meanwhile a young Coot, doubtless belonging to another brood, as it had lost most of the red of the head and was larger than those I had been watching, on seeing a motherly looking Duck swim by, started to follow; upon which the old Coot who was still patrolling the shore immediately swam down the line of canes and recalled all straying nestlings. That she was patrolling the shore and teaching caution was very evident. When a familiar Duck flew close overhead no one paid any attention, but when a strange hoarse note—probably from a Holbœll Grebe—was heard, the young promptly disappeared in the canes. And when a Marsh Hawk flew over calling, the mother made a pertinent remark that apparently kept the brood close to the protecting cover, while she swam outside looking carefully both ways. When a red necked Holbœll came up from below on her side of the Bridge, she eyed him intently, swimming alongside the canes with her brood till entirely satisfied. When a Bittern with wide brown wings flapped low across the water, the Coulee was suddenly bare of all inhabitants, and I inferred that he was an unusual visitor.

The Grebe which excited the scrutiny of the mother Coot, was seen two or three times from the Bridge, and its *cluck* was given as it came up from below, its black crown so wet that it flattened widely. Beside its *cluck* its "crow note" was heard once. In preening it leaned over showing the characteristic white Grebe breast, and when it went below, large ripples circled out from its vanishing point. It was probably a visitor from the west Sweetwater lakes, for when I saw it last it was swimming down the Coulee toward the lake. As it swam it helped itself in the familiar manner, moving its neck back and forth.

While the Coulee was bare, one day, two small Grebes with the pointed crests and gentle ways of the Eared came up from below and swam along side by side, a line of light running down their wake over the water. Looking just alike, diving simultaneously, coming up nearly together and swimming so close together that they made the point of a wedge for one ripping wake, they sug-

gested a pair of twins. As I was watching them, the horse of the Rural Route mail carrier came jogging along over the Bridge and they disappeared—every one in sight on the Coulee disappeared. When I had taken the farm mail and the carrier surrounded by his bags had gone on, the Coot was the first to reappear, but then from under the Bridge, side by side came the twins, crests up; most attractive little creatures.

In the Stony Point Bay I watched a pair one day swimming around among the canes. The two chums, like the pair seen under the Bridge, swam close together, dived together, and came up together. When the inseparables did get separated for a moment, the one in sight called and looked around nervously, then took a short cut through a cane projection to a bay where it found its missing mate; after which they swam back to their starting point, diving leisurely as they came.

The quiet Eared Grebes were a decided contrast to a pair of cocky little Horned Grebes also seen from the Bridge. The first time I looked down on one of them with his small head, short-pointed bill, and puffy black cheeks, the wind was blowing so hard that the feathers of his light side crests were blown about and he turned nervously from side to side. At my next visit I found him out in the middle of the Coulee by himself, absorbed in pluming and diving. When he came up wet, he would rise above the water and give a droll little forward shake of his body as if on purpose to fluff out the pretty side crests. Sometimes the fluffing would go so far that the black wedge of the crown between the light brown crests would be reduced to a line. As he sat on the water below me, I could see his red eye through the glass, as well as his reddish brown throat and side, and his black back. When he turned and lay on his side the beautiful white Grebe breast shone out as a good distant recognition mark, and he could also be recognized by the adept Grebe way of turning head over bill and vanishing below.

A few days later the cocky little Horned Grebe was feeding in the Coulee throughout the two hours that I spent on the Bridge above. As he came up from feeding below, he would plume his feathers, stretch a wing so that the white patch showed, and sometimes rise and flap both wings. As his crests dried, they looked silvery gray. Before I left he was joined by his mate who I imagined had just come from her nest. But as they were a second pair of twins, I could only judge by inference that as he had already attended to his toilet it must be she who now dipped and plumed and stretched a wing till a webbed foot showed behind.

As I watched them, a Duck flew up the Coulee disappearing around a bend. Then thunder broke from the clouds that had been gathering, and I started for the farmhouse three miles away. As the thunder rolled nearer, instead of conscientiously keeping outside the squares of wheat or following dead furrows where footfalls do no harm, with humble apologies to the farmers, I took short cuts across the growing grain. But even so the storm burst over my head, the rain quickly drenching me and the lightning flashing around me. Some children, pulling mustard in the wheat fields had also been caught, and as I neared the farmhouse I saw the farmer standing in the storm violently waving them to hurry home. Afterwards a friend who had been remonstrating with me about wading in the sloughs, quoted statistics regarding the number of people killed annually on the treeless prairies of North Dakota, ending by admonishing me never to be caught out in another thunder storm! So,

thereafter, before making my trips to the Bridge, I scrupulously noted both wind and weather. There was no use going, as I discovered after some fruitless six mile walks, if the wind were either east or west, for in those cases it swept the Coulee bare.

On one day when all the conditions were favorable, I found the Coulee on the west side of the Bridge occupied by Ruddy Ducks, the most individual and interesting of Ducks. The Ruddy might have been developed solely for the comfort of beginners tired of wrestling with obscure species. Signs hang all over him proclaiming his name. In profile he is a chunky little reddish brown tub of a Duck, with head and spike tail up at angles. His white cheek patch is a sign that all who run may read, and when he turns to swim away, the white under coverts of his upraised, uniquely-spiked fan tail label him again. But when he turns full face with the sun on him, his bright blue bill resting on his puffy ruddy breast is so striking that it seems almost unbelievable. A Duck with an Alice blue bill seems the height of absurdity! A detail decoration of this already overdone figure is added when his wet parted crown feathers stand up as two black-pointed crests above his blue bill!

Five handsome Ruddy drakes and a number of nondescript dingy brown ducks were on the Coulee, and from the Bridge I watched them for an hour or so, fascinated by the animated courtship play of the drakes, strikingly ruddy in the sun. When I arrived only two pairs were in evidence, the puffy little drakes looking very cocky and belligerent, suggesting pouter doves with their air of importance and the curious muscular efforts by which they produced their strange notes. When I first saw one perform, not knowing about his tracheal air-sac I thought he might be picking at his breast or have something stuck in his throat and be choking. With quick nods of the head that jerked the chin in, he pumped up and down, till finally a harsh guttural cluck was emited from his smooth blue bill. Often in doing chin exercises the little drakes pumped up a labored *ip-ip-ip-ip-ip—cluck, cluck'*, producing it with such effort that the vertical tail pressed forward over the back, as if to help in the expulsion, afterwards springing erect again.

Once a drake faced a duck about a yard from him and did his chin exercises and gave his raucous cluck as if definitely addressing her, but usually the performance was for the benefit of a rival. In one case two drakes faced each other a yard or so apart, and after nodding and jerking and clucking, with the feathers of their backs bristled up, swam at each other, such a violent chase ensuing that at the end the pursued dived to escape the pursuer. When no rivals were near, the drakes would sometimes make a noisy rush through the water —rising and paddling rapidly as if from pure excess of animal spirits.

There were soon three pairs of Ruddies on the scene, or rather three ducks and three drakes, for courtship was by no means over. As the action progressed, it became so rapid and complicated that it was hard to keep track of individuals and judge the merits of the case. When greatly excited the drakes would swim around with heads back and spike tails thrown forward till head and tail nearly met, their pose suggesting the courtship attitudinizing of Marsh Wrens; but when chasing each other with backs bristled up, an especially bellicose appearance was given by their swimming low with spike tails pressing the water, when they would rush along with a noise suggesting castanets.

Meanwhile the brown ducks, for the most part, swam along the edge of the Coulee, feeding or bathing as if quite indifferent to the play going on be-

fore them; and when the drakes joined them, they all swam around in prosaic unemotional fashion. One of the ducks, however, had been singled out and apparently won, for she was certainly being championed most vigorously. But, as if she were a prime favorite whose suitors could not give her up, her lord, whom I dubbed Lord of the Fray, went about with the proprietory airs of one whose possessions are disputed. When other drakes were near, he swam close beside her, getting her rapidly out of the way, and when perhaps a rejected suitor swam in toward her, chased him back with a decided air of "This is *my* mate, I'd have you know!" When matters were comparatively quiet, the Lord of the Fray having properly disciplined all the drakes on the west side of the Bridge, from the east side, swimming in under the Bridge, came a fourth drake, and with the appearance of an ardent suitor, swam straight toward the much disputed lady. At this the enfuriated Lord of the Fray bristled up, put his head down and swam at the interloper so hard he had to dive, ignominiously. When he finally came up he hung around for a while, but was so persistently snubbed that he soon swam back to his own side of the Coulee. It was altogether a most amusing comedy, but after all, why should we laugh when the unconscious players were merely puppets in Nature's hands as she worked out the great law of monogamy?

While the Ruddies were engaged in their jousting, though a Shoveller flew down with his *chuck-ah*, a Marsh Hawk beat over the tules, and a Crow passed nagged by a Redwing, nobody paid any attention; the pre-occupied Ducks ignoring them as completely as they did the ecstatic outbursts of the Sora from the high grass beneath the Bridge. This was on July 1. On July 3, although there was such a strong east wind that the large lake on the east of the road was angry with white-capped rollers, two Ruddy drakes were swimming along the Coulee. So peaceable were they, I could but conclude that courtship rivalries were over and their brown mates were inside the marsh, happily engaged in nest making. When a Shoveller and a Blue-winged Teal swam up the Coulee close to one of the Ruddies, he never turned a feather. The Law of the Family had been established. A Ruddy drake that I saw on July 6 swam out from under the Bridge, back ruffed up and tail down as if ready for the fray; but as no one came, he put up his tail, did chin exercises and clucked to himself, or —perhaps a brown dame was within hearing inside the canes.

Soon after this I started on my visits to other lakes, but late in August, I revisited the Bridge. With a strong west wind there was little to be seen on the sparkling water of the Coulee, but a sudden rapturous burst of song came from a Sora, probably the very one that had answered me by mistake earlier in the summer. The Yellow Warbler and Song Sparrow piped up as in June, but the cane bordering the Coulee had grown much higher, and brown topping plumes waved in the wind. A flock of Blue-wings flew rapidly by, and a solitary Shoveller, perhaps from a belated nest, lit on the water. At a sudden *plunk* at the end of the Bridge below me, I peered down discovering the head of a swimming muskrat. Its nose was well up out of the water, and I could see its hairy back and long ratty tail as it swam. But just then it dived under the Bridge, and was seen no more.

As I listened, a new sound was heard—the *thud, thud, thud* of a threshing machine in a wheat field beyond. Belching out straw, it was rapidly building up a high straw stack. Sheaves still standing, bundles being loaded onto some of the wagons, and carried up to the machine by others, made a busy scene. A

few days later—August 26—in crossing the Bridge again I happened on the concluding chapter of the Ruddies' history—a mother Ruddy leading five tiny ducklings up the Coulee—so, in spite of its unavoidable gaps, my Bridge work came to a satisfactory conclusion.

In following the marsh-bordered windings of the Coulee from the Bridge to the northeast, one day, I came to a small open lake, evidently connected with the Coulee in high water, over which two white Terns and a large white Gull were hunting. Commanding the lake was a brushy ridge probably used for hunting cover as the Ducks were hopelessly wild. When I appeared in sight a flock of perhaps a hundred Scaups rose, and soon after all stragglers of whatever kind departed. Beyond the lake, as I followed a cow path overlooking the Coulee and the adjoining pastures, filled with horses and cattle, an old Norwegian woman having a handkerchief tied over her head, and wearing a foreign looking cloth jacket and a big blue apron, came laboriously trudging up the path toward me, followed by two dogs. The dogs, like some of the horses and children I met in my unfamilar field costume, completed by camp stool and glass, shrank away afraid of me, but the weary old woman, after our greeting, motioned me to open my camp stool for her to rest. When I questioned her about the waterways in sight she pointed to the Coulee and making bends above and below, said "Lak, lak", going on in Norwegian with explanations that were lost on me.

Farther north, three miles east of the farmhouse across the prairie, and near the family tree claim, as I discovered later, was a second Bridge over the Coulee, and one afternoon about the middle of July, taking a child with me, I drove over in the family two-wheeled cart. As we approached, no water was in sight, but the high black frame of the iron Bridge loomed up from the surrounding greenness. A grass grown road led to it and the Bridge floor itself was earthed and green. "No automobiles go over that road once in six months" I had been assured when told to hitch old Polly to the Bridge—no fence being within reach—and I could well believe it when looking up the dim road beyond to the farmhouse on the horizon.

A flock of pretty little Bank Swallows almost flew into us at the end of the Bridge as if surprised by our presence, and fluttered and hesitated so close to us that the dusky bands on the white breasts were conspicuous. Barn Swallows were flying about the Bridge, now over, now under, and small voices from below us hinted that they were feeding young in safe niches of the foundation. A pedestrian—a Franklin ground squirrel, quite different from the "flicker-tail" in having a dark back and long tail, came trotting across the Bridge with pretty confidence.

Though the Coulee was here on its way down to the second Bridge, its current was so sluggish that it seemed to end in the green marsh grass. Coots had splashed away through the green on our approach and through the water weeds I could just make out a blackish head stretched cautiously around a bend of cane. Along the borders of narrow waterways glimpses were had of other swimmers, and once I caught sight of the snaky head of a Pied-billed Grebe, my first in several years, but it quickly dived and did not reappear. A brown Bittern rose from the edge of the canes and flew away, a pair of Black Terns were evidently feeding young in the marsh, one of them with food in its bill hesitating and scolding over our heads. Yellow-headed Blackbirds and Redwings were also apparently feeding young, the Yellow-heads going down again

and again in the same places in the canes, near which they clung to stalks and emitted their strange notes, their Red-headed Woodpecker *kar'r'r* and their Redwing *karrowe'* and *kerrup*. Maryland Yellowthroats were singing and the scale of the Sora came up from various parts of the marsh. In a mass of green at the end of the Bridge I caught sight of a mite of a Marsh Wren atilt of a stalk, singing a squeaky little song, *clack, clack-ah, clack-ah, clack* that changed to a scolding chatter as he watched us—*cha-cha-cha-cha-cha, cha.* But best of all were the loud joyous songs of the two Bobolinks, the Bobolink of the Meadows, and the Bobolink of the Sloughs.

From the water below us came the unmistakable throaty pumping of the Ruddy—*ip-ip-ip-ip-ip-ip—cluck'*, *ip-ip-ip-ip-ip-ip—cluck'*. Absurd, self-important little chap! At the flat *tub'* of a Coot, Ruddy bridled, sat up, pumped, and clucked again. He was so close below and apparently so fearless that I forgot everything but my pleasure and interest in finding him there, and, off guard, must have moved, for, dropping his cocky air, he hurriedly started for shore, diving and swimming under water, coming up only to dive again. My little companion, greatly impressed by the field glass she held in her hand asked eagerly. "You can't see him through the water, diving, *with this here*, can you?"

As I gazed down from the Bridge over the narrow waterways through the green, looking for swimmers, a handsome yellow and black snake pulled himself sinuously across the Coulee. Beautiful tree-like water weeds standing in the stream bed and reaching up to the sunlit surface looked like golden filaments. On the opposite side of the Bridge, the knightly spears of tall Sagittarias rose above the water, while hair-like masses of weed lay on the surface garlanded with delicate flowers as if decorating the brows of some floating Elaine. Small blue dragon flies resting on the water weeds, large gauzy black-banded ones flying above, and exquisite orange-colored gauzy wings alighting on the Bridge, birds of the air flying about freely overhead, birds of the water swimming secretly through the mazes below, made a fascinating scene.

Over the Bridge-framed pictures of green fields and white clouds, the lights and shades shifted, with developing charm of color. With the sun under a cloud, the wheat fields were a dull green; as the clouds broke away at the edges, long streaks of light illumined the prairies; and when the last clouds melted away the whole broad landscape was flooded with warm yellow light. After watching the birds for a long time in their setting, the peace and beauty of that setting gradually dominated all the rest.

A strange Bridge it seemed—no link in the noisy traffic of the world, but merely a green-carpeted span across a green-veiled waterway, idling between green farm lands, winding around reedy bends and losing itself in marshy meadow borders; the only sounds coming from it, the buzzing of insects and the call of birds, as the sweet air of the prairie breathed quietly over it. No intrusive discordant elements of world traffic could enter here—no shrieking boat whistles, no rattling railroad trains. Away to the horizon stretched the green blanket, so far that, as you gazed, you felt the convexity of the great prairie—windmill sails on one horizon, houses half hid in wheat on the other. Even the untutored child at my side was impressed by it, asking incredulously, "Ain't there *no end* to the world?"

(*To be continued*)

THE SOLITAIRES OF SHASTA*

By WILLIAM LEON DAWSON

WITH FIVE PHOTOS BY THE AUTHOR

WHENEVER I recall those two magic weeks spent near timberline on Mount Shasta, I cannot be sure which image comes up first, whether the chaste menace of the eternal snows which crown the summit, the somber forest of the Shasta fir trees which girdles the mountain midway, or the gray ghostly shape of a bird which flits and vanishes by turn throughout that haunted forest. The snow-cap was a thing apart,—remote, incomparable, birdless; but the Shasta Fir (*Abies shastensis*), and the Townsend Solitaire (*Myadestes townsendi*) were paired entities, inseparable in the thought of a birdman. If the bird had elected to hide his nest in the ample draperies of blackbeard "moss" (the lichen, *Alectoria fremonti*), which clothed and disguised most of the trees, there would have been no occasion to write this history. A Ruby-crowned Kinglet, better advised, dared to tease us, daily, with his exulting song, and that right on the confines of Hardscramble Camp; for many wasted hours had taught us that his secret at least was secure in that mossy paradise. The guileless Solitaires, instead, placed their nests oftenest at the base of some giant of the forest, trusting to humility and chance. But if they took chances in the open, they did not publish their immediate whereabouts by unguarded song nor by fatuous visitations. Every nest discovered was the reward of diligent search, or else it was a gift, so earnestly desired that it was hailed as good fortune not to be despised because it was, for once, gratuitous.

At the time of our arrival at timberline, July 7, 1916, Solitaires were nesting, or had nested, at every lower level down to 5000 feet. In the yellow pine belt discreetly anxious mothers were supervising the education of hobbledehoys who rather resented further attention. But the snows had lingered late that season. Moreover, they had been replenished by a heavy and very unseasonable downfall on the first day of the month. The birds which were accustomed to nesting at higher levels were crowding the retreating snows in their anxiety to begin the nesting season. In all probability many nests had been overwhelmed, so that thereafter we were really witnessing a second nesting season. At any rate, the birds continued in full song up to the time of our departure, July 19; whereas Dr. Merriam, who arrived on Shasta July 15, 1898, saw but six birds, and declared them to be "always silent". Silent! Well, perhaps the future distinguished monographer of bears was even then attuning his ears to the music of *Ursus hoots.*

With this much by way of introduction, and because the writer has a theory that bird articles ought to write themselves (if the field work has been attended to), he is going to ask the liberty of quoting from his note-books, with only slight emendation and rearrangement, and so to present six separate sketches of Solitaires on Shasta.

V147/2-16 Townsend Solitaire; alt. 7200, July 8: Male heard singing in the tree-tops. The bird is evidently shifting about from place to place in a beautiful fir grove. His song is wierd, eccentric, and unstudied, as refreshing as it

*Contribution from the Museum of Comparative Oology.

is inconstant—scarcely excellent enough to have merited Newberry's encomium of "best", yet very gratifying to the ear,—and rare.

Bert [Mr. A. G. Vrooman, of Santa Cruz] had the good fortune to find the nest of a Townsend Solitaire 12 feet up in the heart of a rotten fir stump. All he had to go by was a bit of outcropping black moss, so he hit the stump a whack on general principles, and out flashed the bird. Since Bert had never even seen a Townsend Solitaire but once before in his life (in Trinity County, July 3, 1916), he was appropriately elated. He had, however, just been through a seance with another Solitaire about 100 yards away, and this, too, while he was passing a dead stump. The bird had appeared from the direction in which it had first been heard singing, and as it passed him it began to hover with slowly flutter-

Fig. 1. NESTING HAUNT OF TOWNSEND SOLITAIRE. POSITION OF NEST V148/3-16 IS INDICATED BY WHITE X.

ing wings, and with every appearance of solicitude. And this it did for a distance of a hundred yards, or until just before it lighted in a tree.

We have just visited the stub together. The bird flushed silently. We glanced hastily at the two eggs which the nest contained, then retired to a distance of thirty yards. Almost immediately the bird came back, so that we fear advanced incubation. The male presently came up also and sat silently, in plain sight, some fifty yards away. He scarcely moves and he says nothing, for *M. townsendi* is a very patient bird.

July 10: Returning to claim the eggs, we find the bird on, facing toward the exit. The eggs prove to be dead and, therefore, of quite an unknown age—

though one surmises the storm of the first of the month as the occasion of temporary desertion and consequent disaster. One of the eggs, moreover, has an ancient puncture, like a bill stab. The bird returned immediately after my first investigation, as she did also after I had taken the eggs. Quite daffy, you see! The heart wood of the stump proved to be so rotten that I could do nothing with it but tear it away, but I did save two neighboring chunks by way of local atmosphere. Nest composed chiefly of the blackbeard lichen (*Alectoria fremonti*) with a little ornamentation, upon the skirts, of the yellow-green lichen (*Evernia vulpina*). After I had removed the nest, both birds sat about, within twenty yards or so, and gave vent to the tiniest notes of complaint.

V148/4-16 Townsend Solitaire, Hardscramble Camp (alt. 8000); July 10: A Townsend Solitaire sings from a dead limb near the summit of a tall fir tree, not less than 150 feet above the ground. The song is broken and fragmentary, and is rendered in a matter-of-fact, passionless way which harmonizes well enough with the sedate bearing of the bird. Although it was a hot day, I could fancy that the sentry sang with redoubled vigor as he saw me poking and prying about old stumps and upturned roots. The joke is on me, and he knows it.

July 12: We have been regaled from time to time by Solitaire music proceeding from a point about 300 yards southwest of camp. Bert went down on Sunday, July 9, and was treated to a fluttering performance on the part of the male. He hunted diligently, but without result, while the male watched him silently from an elevated station. We returned to the charge together on Monday, but since we looked only for a stump nest we were unsuccessful. Hunting alone that afternoon in another locality, Bert found a nest, n/3, (to be reported later) *under the base of a tree.* With this clew Bert returned to the present prospect yesterday, determined to succeed. The male bird gave him no better light than before, so he set to work systematically to investigate the base of every tree in the neighborhood. At the end of two hours he flushed the bird from the downhill, or protected, side of a big Shasta fir, at least a hundred yards from the original station. The bird flushed and fluttered away like a gray ghost, and as silently. About 50 yards away Bert found what looked like a decoy nest, or abandoned claim, under the curving base of a tree. There was an abundance of fir twigs heaped about, and the rough outlines of a hollow, but no lining, save one chunk of blackbeard moss.

Today we are "trying her out" with a view to getting a picture of the sitting bird on her nest. She flushed very quickly at first, and required fifteen minutes and many feints to return. She flushed again as I leveled the Graflex at her, but she is back after a five minute interval. After another turn at settling and flushing, we watched the bird feint and settle. Almost immediately the male bird, whose presence we had not previously suspected, flew down to see that his mate was well placed, then instantly took himself off.

I succeed in snapping at 11 feet this time, but have a very poor show with the Ross lens. However, the light improves, as well as the disposition of my lady, and, to my amazement, I am able to get her with the Heliar, 8 ft., 7 ft., 6 ft.—all this not without many flushings and feintings. Finally, the sun shines full upon the critical spot,—5 ft., 4 ft., 3½ ft.—glorious! until the last plate is used up. Then I try the Premo with tripod. This bothers the birdie. She ventures back but is ill at ease and pops off again at the slightest excuse. It looks too much like a trap, especially when I come back to "work" it. A tube would have been the thing, but I am without one this year. Finally, in despair, I lie down by

the camera. The bird does come back at last, but she will not suffer any motion on my part. The light plays out and the game is off. The presence of the male, too, with his low creaks of solicitude has undoubtedly made the female more sensitive. The taking of the nest after all,—this is a heart-breaking matter; but Solitaires are more common than we are.

Nest a very frail, careless affair of scattered and spread sticks covering an area a foot square. Nest-hollow, carefully lined with grass obtained at some disance, 3 inches across by 1½ deep.

The most important point to emphasize in the situation is the near presence of snowdrifts half encircling the tree under which the nest is placed, as, of course, the photographs show. The significance of this did not fully occur to me until in the afternoon Bert showed me the nest which is to be (D. V.) *V149/3-16 T. S.*

Fig. 2. Nest and Eggs of Townsend Solitaire; V148/4-16.

The bird flushed lightly from a situation almost exactly like that of *V148/4-16*, and then fell to bug-catching. In this pursuit she again and again *alighted upon the snow*, securing there, no doubt, benumbed or dead insects—a sort of Leucosticte of the lower levels. Snowbanks, then, are, perhaps, an agreeable feature of Solitaire environment. We spend the afternoon looking up Solitaire prospects, and hear three singing males, all believed to be new.

V149/3-16 Townsend Solitaire, alt. 6900 feet, July 13, 1916: Nest found Monday, July 10, left for egg complement; revisited yesterday, as mentioned. My hat is off to Mr. Vrooman for having made this location, for the crooked-based tree which gives the nest shelter is simply one of ten thousand which clothe the mountain; and the male does nothing more by his presence than to set one to looking anywhere within 200 yards. Nevertheless these exact conditions have to be met: shade, shelter, outlook, and the near presence of snow-banks. The sharp falling-away of the ground immediately below this tree, i. e., after the nesting

shelf is cleared, would seem to make it peculiarly acceptable. The composition, or rather the setting of the nest, even more than in case of *V148* suggests complete harmony with its surroundings. For, curiously enough, there are some fallen wisps or bunches of the yellow-green lichen at the base of nearly every tree hereabouts, and as likely as not a considerable admixture of the blackbeard moss. In searching, therefore, one sees dozens of spots which precisely resemble this one, nest and all.

The bird had just gone into shadow today as I made my appearance at 1:15 P. M. I have considerable time, therefore, to accustom her to the presence of the camera before the next full sunshine falls. The male sings a little in the offing just to let her know he is on the job. At my first approach the female allowed me to come within five feet, then dashing silently off and downward, fluttered ostentatiously over the ground. I retired while she had a bug or two, exchanged confidences with her solicitous mate, made a feint or two and was back, within five minutes. At my second approach I got within three feet before she flushed. Then she flew silently about 15 feet before she checked, and began to fluttter laboriously, with tail depressed and wings held high. I retired and she was back, by direct descent from an overhead limb, within two minutes. Thereafter follows nearly an hour of getting acquainted—so successful, indeed, that I am miserable over the prospect of either horn of the dilemma, taking or leaving the eggs. I make advances quite professionally, but my heart does not go out, and my methods are both harsh and hasty. Nevertheless, when the shadow does clear at three o'clock, I have the bird tamed so that I can go right up with the Graflex and *bang away at two feet*. This I did *ad nauseam*, and the bird never stirred. But when I brought up the Premo and tripod and stood it over her, then there was trouble. She would stand the camera, but she wouldn't let me put out my hand to snap it. But she was plucky! Back and forth she went, back and forth,—till, finally, I took charge of the situation and photographed the eggs. Then I put my photographic apparatus up, intending to take the eggs in spite of all conscience. But the way that bird recovered those eggs would have melted the heart of a rhinoceros. I photographed her some more, then sat down to write these notes. The eggs are exceptionally large and handsome with heavy red spotting. The nest would be a prize in itself, composed, as it is, chiefly of blackbeard lichen, whose skirts overlie heavy clumps of Evernia lichen, like lace over silk. The nesting hollow is, of course, of fine dry grass.

During our prolonged seance we were visited by several curious birds, notably a pair of Red-breasted Nuthatches. Once I found my Graflex camera unwittingly pointed at a nuthatch not over six feet away; but alas! I had on the Ross lens, whose minimum range is 11 feet.

215/3-16 Townsend Solitaire; Squaw Creek; alt. 7800 feet; July 14, 1916: At the first sound of a singing Solitaire, I set to work to look for nests at the foot of the trees. Almost immediately I found one tucked away in a cranny under the base of a giant Shasta fir, so completely concealed, indeed, that not a twig of its fourteen-inch spread could be seen from a point straight above. The twigs were in perfect condition, but the disarray of the grass lining, as well as the sodden condition of the only bit of moss, blackbeard lichen, which the structure boasted, apprised one that he was viewing an old nest, presumably last year's.

The hillside here carries a magnificent forest of Shasta firs, each with its curve-kneed base and its lichen-covered shelf on the under side. The ground was, also, sharply sloping and, although a west exposure, is still half covered with

snow. I set to work in good earnest examining the bases, and had accomplished nothing in an hour's work, so sat down on a rock for a cold bite of lunch, determined to see if I could get any lead. I did see a bird flit about 75 yards up the hill, but it disappeared against, or behind, a tree bole and I saw nothing more of it. These birds have a marvelous way of slipping around unobserved. The next I knew a male was singing overhead 125 feet up. By and by I had the rare pleasure of seeing and hearing the ecstatic song flight of the male. From a height well above the treetops and 300 feet above the earth, he descended, slowly, in a great spiral, with fluttering wings. More than ever he looked like a Mockingbird, except that his action did not savor of the grotesque. The song torrent was light and sprightly in character, reminding me more of the breathless rhapsody of the Lark Sparrow than of the measured accents of the Thrush. This

Fig. 3. Nest and eggs of Townsend Solitaire; V149/3-16.

exercise over, the bird descended through the trees and allowed himself to be seen on several occasions in an open bit about a hundred yards down the hill. Several times he visited the ground, and twice I saw another bird of the same species get up. Once there was quite a spirited passage, a bug and a hug as near as I could make out, after which the mysterious second bird disappeared by a dive to earth. I'm on to their game this time, I guess.

With quite a complacent feeling I worked my way down to the scene after lunch. In my confidence I even stopped to take off my sopping boots and dry them, preparatory to "landing" the nest. The male improved the occasion by betraying his anxiety in various ways—first by little sotto voce snatches of song intended for the ear of the sitting female, and then by that weird pendulum creak, whose qualities I have so often remarked. This sound is really indescribable, yet it invites renewed effort at comparison. It has been called a "bell

note", but it is more nearly a bell-like croak, a ghostly, ventriloquistic, droning sound, a rusty hinge creaking in the wind, a voice of conscience coming from no whither and heard within.

But the bird was not to be found at the base of a certain preappointed tree. Nor yet was it found with the nearest neighbors. What could have become of it? A quickened and then an anxious search followed. But there were no more leadings from the birds. Frantically I examined every tree base within a hundred yards. Nothing doing. This repeated loss of time was getting serious. Fervently I prayed, "Oh, Lord, let me succeed just this once". I half believed the answer would come, but I had some misgivings as touching the efficacy of the *bird's* prayer.

Well, before I went back to camp I would toil up the hill and see if there was anything doing on the hillside, where I had seen the bird disappear. Cunning hidey holes there were at the bases of the trees, but no nest. A bit of moss which protruded from a tree-trunk, a noble bole 3½ feet in diameter, a little below where the regular coating of Evernia commenced, attracted my eye. It seemed to come from a hole rather than from the surface, as the other moss did. I levelled the binoculars. There was quite a bunch of moss in the hole, and behind the moss a gray head and a—yes, I am sure that is a glittering *eye*. Why—why, that's the tree where my bird disappeared! *It flew straight into its nest and I never knew it.* But whoever would have thought of such a thing? An unbroken shaft of a sturdy live tree, forty feet to the lowest limb, and clad, as all proper fir trees are, from about twenty feet up—above the snow line—with a shaggy coating of Evernia lichen. Yet here was this hole as sharp cut as the print of a giant spear-thrust, eight feet up from the ground.

Well, the bird flushed when I was within twenty feet and I never saw her again until the nest was gathered (perhaps I didn't look very hard; I wasn't in a sentimental mood). The hole was ten inches deep both horizontally and vertically, but was only four inches wide in the middle passage. The bird had shaped her architecture admirably to the accommodations and even sat with tail pointed in—quite a luxury for cramped quarters. Nesting hollow 3 inches across and 2 deep, grass and pine needles with twigs and abundant moss (Evernia lichen) for the porch and filling. Bird returned repeatedly and silently after nest was removed, but there was no further demonstration either on her part or that of the male. Eggs fresh as paint!

218/4-16 Townsend Solitaire; alt. 8200; July 17: You never know your luck! Also, they nest *anywhere.* I had eaten my Monday lunch in a sunny clearing, which had once been swept by a landslide, but is now being re-covered with scattered saplings. After that I set out to cross the remainder of the clearing, when I spied a Townsend Solitaire sitting in the top of a small sapling about fifty feet from the edge of the woods. He was almost immediately joined by a bird which seemed to come up out of the open (dwarf) manzanita. There was a feeding scene, with some evidence of tender solicitude, whereupon both adjourned to the woods. I followed, after an interval, and as I entered the somber depths a bird shot back past me into the open, and disappeared in a flash into the central depressed portion of the manzanita patch. I followed again in some bewilderment, looked carefully at the bases of the few saplings in range, peeked under a few stones, and headed for another, for no particular reason, since it was one of hundreds. But out from under this one flushed Mistress Myadestes, and the secret was out,—*218/4-16 Townsend Solitaire,* right out in the open of

a sunny hillside. The nest is a very slimsy affair composed entirely of needles of the white-bark pine, with a front porch, or skirting, of pine and fir twigs. The needles have no coherence, and merely line thickly a hollow made in the soil under the full protection of a rock, and behind a partial screen of dwarf manzanita (*Arctostaphylos nevadensis*). Hollow of nest 4 inches across by 2 deep. Skirt, which was saved and wrapped separately, about 4 inches wide. Female only flitted back and forth restlessly and uncomplainingly, alighting for the most part on one and another of the tiny fir saplings. Eggs about half incubated.

V150/3-16 Townsend Solitaire; alt. 7500; July 19, 1916: Bert had made the location six days ago, Thursday, July 13, but the nest at that time had no lining,

Fig. 4. Townsend Solitaire on nest at base of Shasta Fir.

and he was skeptical of results in the time allowed. The nest was a straight find on his part, on the basis of birds seen in the neighborhood and manifestation of desire for mating on the part of the female. Nest under rock on sloping hillside in deep woods. Shasta firs up to five feet in diameter in immediate neighborhood and snow all around, the nearest bank fifteen feet away.

As we approached, this evening at six, the bird was sitting tightly, so we suppose the set to be complete. Certainly this is quick work from a nest without a vestige of grass six days ago! Nest in triangular, receding cranny, with earth floor ten inches deep under cover, six inches wide at middle of nest. Nest proper 3½ inches wide; 1¾ deep. Twigs covered with blackbeard moss for skirt, some

grass for lining. Bird gave the *dong* or *creak* note after we had taken the nest. Male afterwards sang snatches of song in the distance, but neither put in an appearance.

This makes the sixth set of Townsend Solitaire which we have taken in ten days. It is altogether probable that this species is the commonest and best distributed in the Shasta fir belt and the mixed belt immediately below. If we reckon the belt at three miles wide and fifty long, and allow for each pair of birds an area one-quarter of a mile square, we have fifteen hundred as the Solitaire population of Shasta, a figure I believe to be well within the mark.

Mr. Vrooman was particularly successful in finding old nests, as well as

Fig. 5. Nesting Site in Dwarf Manzanita. Location of Nest 218/4-16 is indicated by white x.

new. He showed me another ancient relic in a rotten stump three feet up, and told me of four which he had found in upturned roots of fallen trees. Besides this he showed me an abandoned claim in a cranny formed by a broken but not completely severed tree, where the birds had deposited a few twigs, a bit of moss and several blades of grass. The evidence was scanty but sufficient. But also the cause of dissatisfaction was manifest, for the quarters were quite too narrow.

Santa Barbara, August 4, 1916: Having still to blow the eggs of *V150/3-16 T. S.*, I pause to note exact colorings. In ground color the three eggs represent the two types of coloration spoken of by Grinnell in his San Bernardino Re-

port, namely, the white with palest possible blue-gray tinge, and the definitely light blue type. In this set one egg appears almost pinkish as to ground, by reason of the diffusion of red markings, and the probable warming effect of the contents. The more pronounced type is of the palest niagara green; while the markings of both are of ochre red and prussian red.

These six sets of eggs reposing in nests "taken with the bloom on", now occupy an entire drawer in the collection of the Museum of Comparative Oology. *Only one of those who gaze upon them is able to recall a flood of delightful memories (Bert alas! is exiled at Santa Cruz); but with these authoritative trophies* for a text the Director will be able to point out to hundreds of others something of the "meaning of things", and to fill the minds of strangers with a sharp unrest until they too have heard the Solitaire sing on Shasta.

Santa Barbara, California, December 1, 1918.

NESTING OF THE SHORT-EARED OWL IN WESTERN WASHINGTON

By E. A. KITCHIN

WITH FOUR PHOTOS BY E. A. KITCHIN AND J. H. BOWLES

IT HAS heretofore been an unsettled subject, though much discussed among the bird men of this vicinity—that of the local nesting of the Short-eared Owl (*Asio flammeus*). Though the birds are common in the fall and winter, no records had been established of their breeding here.

Our Tacoma tide-flats cover several square miles of territory. Through the center runs a road that acts as a dyke, keeping out the tide that at one time covered nearly all this region, especially in the winter when the highest tides occur. Deep sloughs that twist and turn, intersect this whole section and act as channels for the waters of the incoming and outgoing tides. In the winter the Short-eared Owls are generally flushed from the edges of these sloughs where they hide most of the day, under some over-hanging grass or weeds.

Judging from various descriptions of nesting locations east of the Cascades, the proper places to search seemed to be where the grass or cover was long enough to afford good concealment for the large clutch of white eggs. I knew a sixty-acre tract on our flats answering this description, lying well above the summer tides. Last year I worked back and forth over this ground, using up several precious Sundays, but failed to locate a nest or even to flush a bird; and were it not for the fact that on one certain afternoon I saw two pairs of owls skimming back and forth in search of food, I would not have tried again. Firmly convinced that they did not use this heavily grassed section, I resolved this year to try the edges of the sloughs, their habitation in the winter months, the result being that two nests were found and photographs and records made.

My first effort this year (1918) was on May 6. Securing a stick about eight feet long, I traveled up the side of one slough and then down the other, keeping the length of the stick from the edge, and after about two hours of this was rewarded by flushing the owl from her "nest and four". When she jumped she scattered three of the eggs out of the nest but none was broken. The nest was placed in a very open position and the eggs could be seen sixty feet away. A

slight excavation scratched in the hard ground and lined with a few short stalks of coarse grass, was all the material used or work done. The coloring of the bird on the nest so blended with the surrounding grass, that one had to get very near to distinguish her. When flushed she did not remain near the nest, but departed, with a small army of Red-winged Blackbirds in pursuit. A visit two hours afterward found her back on the eggs, where she was left undisturbed.

Though we did not collect any of the parent birds, I am taking it for granted that it was the female that was always on the nest; we generally flushed the male from his own little den nearby.

The next day, accompanied by Mr. J. H. Bowles, I again visited the nest, flushing the bird at about twenty-five feet. We found the eggs "pipped" so, after taking several photographs, we beat a hasty retreat as there was a cold north wind blowing and the eggs needed protection. Careful examination of the nest and vicinity failed to reveal any remains of food, nor were there feathers

Fig. 6. TIDAL MARSH NEAR TACOMA. THE EDGES OF THESE SLOUGHS ARE USED AS HIDING PLACES AND NESTING SITES BY THE SHORT-EARED OWL.

of any kind in the nest. I am mentioning this as we found a different condition a week later.

We then "roped" another section of the flats and were rewarded by flushing a bird off her nest, which contained three eggs. These eggs were also "pipped", and the nest lay in the same exposed position as the former one and at about the same distance from the edge of a slough. The ground here was not quite so hard and there were four or five dead weed stalks for a back-ground. The male jumped less than a hundred feet away. Both birds left at once and were not seen again while we were in the vicinity.

On May 18, a week later, I paid my next visit, accompanied by Mr. Stanton Warburton, Jr. Visiting the first nest, we found the bird upon it. Only two

young occupied the nest, and they were rudely spilled out when the old bird left. One was big and strong, but the other was very small and weak. The larger bird snapped his bill in true owl fashion. There were no remains of the other two eggs, but we strongly suspect a crow had something to do with their disappearance, as four white eggs, exposed, can be seen from quite a distance, and this section is a common flyway of crows.

There were no signs of food about the nest, except a quantity of small bird feathers, which startled us somewhat, as we never had cause to suspect these owls of preying upon birds of any kind. The wing of a Lutescent Warbler was easily recognized, and there were plenty of feathers of either the Russet-backed or the Alaska Hermit Thrush, as well as those of the Western Meadowlark. The male bird was not seen on this trip and the female left at once.

Visiting nest number two, we found that all three eggs had hatched, and it contained two large owlets and one little fellow several days younger. The nest

Fig. 7. Nest and Eggs of Short-eared Owl. The first set found.
Photo by J. H. Bowles.

also held a headless mouse, and a quantity of bird feathers. We identified the Lutescent Warbler, likewise thrush feathers and some undoubtedly of the Western Savannah Sparrow. The female allowed a nearer approach than before, about fifteen feet, and hovered over our heads at a distance of perhaps a hundred yards.

We were here treated to a most ridiculous performance by the male bird. While watching the female we suddenly heard an awful groaning and chuckling sound behind us. This was the male and he was mad clear through, darting back and forth and uttering these awful sounds. Finally, he could stand it no longer and literally dove into a bunch of high weeds, where he twisted and turned, and to watch the tops of the weeds one would think that nothing less than a death struggle was going on. Finding this would not decoy us he joined his mate, and they circled overhead, while we took several snap shots and departed.

My next visit was on May 25, one week later. I visited the first nest, but

found no trace of either the two young birds or the old ones; no trace of any recent feeding nor signs of habitation in or about the nest. Of course we do not know what became of them, but feel certain that the old birds had carried their offspring to a new location, as the young were much too small and weak to fly or even to stand up. Leaving the nest, I had not proceeded more than a hundred feet when up jumped a Pintail from her nest and nine eggs, showing that ducks at least are not afraid of Short-eared Owls. But fancy a duck neighboring with cousin "Great Horned"!

Proceeding to the second nest I advanced very quietly, as I wanted to approach it without being seen. This bird seemed to show more care for her young than the other one, and I was very anxious to observe, if I could, just what was going on "at home", nor was I disappointed. During the day it had been very hot and close for this region, but a distant thunder storm had suddenly created a strong cold wind that blew sharply across the flats. Crawling up behind an old

Fig. 8. Same nest as in fig. 7. Young one week old.

log, I peered over the top. The parent bird was lying somewhat sideways, with one wing uplifted, protecting her babies from the cold wind. The three little ones were cuddled up close to the mother bird, reminding one of an old cat with her kittens. What a chance for a real photographer! I tried to get a picture, but the old bird took alarm before I could get near enough. Examination of the nest showed no signs of food other than fresh, tell-tale feathers, which were again in evidence. The little ones, over three weeks old, were still in their downy state, although pin feathers were sticking through. They were still too weak to stand, and lay in a helpless group snapping their bills. Neither of the old birds came near while I remained.

June 1 was the date of my next and final visit. I approached quietly, and was greatly disappointed in finding the nest empty and the birds gone. A careful search for over two hours, up and down and around the nest, failed to dis-

close either young or old birds, nor did the nest look as if it had been occupied for several days. It seemed almost certain that the old birds had carried off the young, perhaps on account of my weekly visits, probably to a new hunting ground. The only thing I am sure about, however, is that the young birds did not fly themselves, as their wings could not have been feathered enough, nor had they the strength. This nest was on what was practically an island formed by the sloughs so that no passerby could have been within several hundred yards of it.

In summing up briefly the knowledge gained by my visits to this owl's nursery, certain items stand out prominently. These are the small sets laid, appar-

Fig. 9. SECOND NEST FOUND. YOUNG THREE WEEKS OLD.
Photo by J. H. Bowles.

ently, by the owls on this side of the mountains, the open sites selected for nesting, and the fact of the parent birds catching and feeding small birds to their young. I hate to accuse them of this, but the truth must come out. Another very striking thing was the manner of flight of the parent birds at times after the young were hatched. They would fly to a height of perhaps a quarter of a mile overhead and then sail about on motionless wings, precisely like a Buteo. A casual observer would never have suspected for a moment that they were owls. Altogether, while no specimens were added to the collection, a most interesting fund of information was gathered for our note books.

Tacoma, Washington, August 3, 1918.

PROBLEM: DO BIRDS MATE FOR LIFE?

By J. EUGENE LAW

WITH ONE PHOTO BY L. E. WYMAN

THE excellent article entitled "Evidence that many birds remain mated for life", by F. C. Willard (CONDOR, xx, 1918, p. 167), is pregnant with problems for the bird ecologist. Another angle of view may further emphasize the value of intensive study, such as Mr. Willard's article indicates, and the necessity of carefully recording in the minutest detail every incident in a bird's life history.

FIG. 10. NEST OF CALIFORNIA BLACK-HEADED GROSBEAK CONSTRUCTED MAINLY OF WILD OATS. THE EGGS SHOWN ARE BORROWED, AS THE TWO EGGS ORIGINALLY FOUND HAD BEEN DESTROYED WHEN THE NEST WAS NEXT VISITED. THE STRIPS AT TOP AND RIGHT ARE EACH ELEVEN INCHES LONG.
Photo by L. E. Wyman.

The precariousness of life among birds leads one, even though paired birds normally remained so, to doubt so uniform an escape from fatality as would follow, did the numerous incidents noted cover pairs mated throughout the period of Mr. Willard's observations. If lost mates were replaced, no doubt the surviving mate drew the new one to the old home of the survivor[1]. Male hummingbirds are notoriously indifferent to any family relations, further than the actual act of fertilization. The Anna Hummingbird is pugnaciously solitary

[1]The writer has had two pairs of Anthony Towhees about his acre-plot home for five years. These birds seemed beyond question to be paired throughout the year and consequently for life. At least twice during that time one of these four individuals was killed in a mouse trap, soon to be replaced by a new mate.

between nesting periods, although it, like the Blue-throated, returns to the same nest twig in successive seasons.

But even if a mate were replaced, might not the individual nesting characteristics be preserved? Does it not seem probable that a female bird normally returns to her bridal-nest locality throughout her life time, even though she habitually forms a new partnership with each successive nesting season? Uniformity in number of eggs, shape of eggs, shade of ground color, style of markings, kind of spot chosen for nest, individual taste in nest construction, could all be satisfied on this hypothesis. Possibly the death of the female would end the series, doubtless so in regard to egg characters and in species where the female alone builds the nest, but might not the surviving male often bring his new mate to the old home, particularly if she had not nested before? How much "my former mate did it this way" talk would avail is, of course, problematical, but an incident related to the writer by Major Allan Brooks indicates a certain tendency along that line. A female Cooper Hawk had been shot from her nest of eggs. Some days later another female, in adult plumage, was found incubating the same eggs, and was likewise shot. What was his surprise later to find a third female occupying the nest, this time a bird in the streaked plumage of a subadult. And as a matter of curiosity she was allowed to, and did, raise the brood.

Environment must exert an important influence on the nest. This would include availability and abundance of nest material normally acceptable within reasonable gathering distance, and, as well, the nature of adaptable sites in the neighborhood chosen for the nest. For while an adaptable site is no doubt the primary requisite to location, in the final analysis food and climatic conditions must be the determining factor, or at least the delimiting factor; and, since in many species each pair occupies its nest vicinity to the exclusion of all others of its kind, abundant population of such species would soon exhaust normal available localities where such localities were limited, and thus crowd some pairs into "unusual sites".

Then, given absence of usual nest material, or of usual nest site, or presence of attractive but unusual nest material in the locality selected, might not successive different nest builders readily display "unusual nest" characters sufficiently similar to suggest the same artist, and deceive even the most careful observer?

A striking example of environmental influence which came to the writer's attention is worth recording, though unfortunately no further data were obtained in subsequent years. A Black-headed Grosbeak, whose normal nest does not differ materially from that of the Rose-breasted, chose a rather open willow thicket some distance from other woods, and in the midst of a field of rank, green, growing wild oats, which also covered the floor of the thicket. The nest was made almost entirely of stalks including heads of the wild oat, still green, and so carelessly put together that the projecting bends and ends made a mass as big as a hat. (See fig. 10.)

It would be interesting to record how many successive seasons individually distinguishable sets and nests were found. Collecting a male here, a female there, and both parents in another place with the characteristic nest, and noting the effect on later nests, sets, and locations, would be of great value, and mating characteristics of families, perhaps of species, thus be worked out. Truly, Mr. Willard has opened up a most fertile field.

Los Angeles, California, November 1, 1918.

EVIDENCE THAT MANY BIRDS REMAIN MATED FOR A NUMBER OF YEARS

By N. K. CARPENTER

WHILE reading an article by Mr. F. C. Willard in a recent number of THE CONDOR, entitled "Evidence that many birds remain mated for life", numerous incidents were recalled by the writer tending to bear out Mr. Willard's conclusions. I have long held the same general idea as was advanced in his paper, but believe further that "separation for cause" is not by any means unknown in the bird world. It might also be stated that the instinct to return to the former nesting site is probably equally strong in both male and female. This is shown by the fact that while a certain pair of birds that nest in the same place for several years will have individual characteristics so pronounced that the location of the nest, and type of markings and shape of the eggs, can be told in advance to a certainty, as stated by Mr. Willard, there will suddenly be a change. The same location is still used, but the eggs are entirely different. A new female apparently is in possession, evidently brought there by the male of the former pair. His spouse may have died or grown too old to rear a family, but it was probably a good and sufficient reason.

The Dotted Canyon Wren (*Catherpes mexicanus punctulatus*) is one of our local species that will return to the same niche in a boulder year after year to rear a family. I have under observation one pair that was first located in 1905. The nest was on a shelf about eight inches square in the side of an immense boulder. This little pot-hole was used to my knowledge in 1905, 1907, 1908, 1909, 1910, 1911, 1913 and 1917. It was not visited in 1906 or 1912, but I have little doubt that the spot was used these years. In 1914 the birds were present, but the nest had been removed, and they had evidently decided on a change of location. It was not until 1917 that they returned to the old nook, although the birds were seen close by each year. The nest and set of eggs were taken, and the past spring (1918) the pair moved to a narrow crack about twenty-five feet away in the same boulder pile. Judging from the markings of the eggs during this period of years the male changed mates or secured a new one but once. The set always consisted of five eggs excepting upon one occasion when six were laid. April 9 was the earliest date that the clutch was found completed and April 25 the latest. Other pairs of this species that I have found in the last few years always return to the old nest if it is not disturbed, even though the set of eggs may have been taken, but the histories of these birds, so far as I know them, are short in comparison with that of the pair just cited.

Our hummingbirds also are easily watched. A Black-chinned Hummingbird (*Archilochus alexandri*) that I know of, built a nest on an electric wire within six inches of a porch light for four successive years. The current was on every evening, but the light did not seem to disturb the bird, who reared one family each season. Another of the same species has constructed its nest for the past four years under an old log bridge, for three successive seasons a new story being added to the old nest. There is a small ravine near here lined with a few stunted sycamores where several hummingbirds, both Black-chinned and Costa (*Calypte costae*) nest each year. In fact, these birds are so consistent in returning to this particular gully that we have named it Hummer Canyon.

I find the Flycatchers very persistent also. One pair of the Ash-throated (*Myiarchus cinerascens cinerascens*) has returned to the same old cavity in an oak tree for the past four seasons, while several other pairs I have watched have each nested two or three times in their own particular stump or cavity. A change by them is generally caused by the old site being destroyed. Our Black Phoebe (*Sayornis nigricans*) having once built a nest will return the following year and use it again after supplying a new lining. This I have found to be the case a number of times. I have seen nests of our Western Kingbird (*Tyrannus verticalis*) two and three stories high, indicating the number of years the nest had been used.

Mr. Willard's experience with the Cabanis Woodpecker (*Dryobates villosus hyloscopus*) is identical with mine. In 1917 I collected a set from a stump that held three other perfect excavations of previous years. This was a small dead cottonwood not over ten feet high, and though there were a great many other similar stumps in the grove, this was the only one that I could locate that contained an excavation of this species.

Our Roadrunners (*Geococcyx californianus*) lay in their chosen cactus patches each year and I have taken as many as three sets from the same nest in successive years. The Raven (*Corvus corax sinuatus*) can be counted on to return to the old home each year, but if disturbed a new nest is usually built the next spring in another ledge or crack nearby.

Members of the sparrow family as a rule are more uncertain, although they return to the same general locality. This is due, I think, to the nature of the location where their nests are placed; for, if substantial forks or hollows were used, I believe we would find the birds returning to the identical spot on successive years. To illustrate the point: Some eight years ago I ran across a few clumps of bunch-grass growing on the side of a steep ravine, under one of which was a slight depression in the hard decomposed granite soil. This was almost hidden by the overhanging grass, and a number of broken eggshells of the Valley Partridge were lying about, showing that a family had been raised there. It appeared to be an ideal spot for the home of a Rufous-crowned Sparrow (*Aimophila ruficeps ruficeps*). Each year, when in this locality, I examined the spot, but not until 1917 was I rewarded. That year the cavity contained a nest and four young of this sparrow. The past spring I was on the ground early, and sure enough the site held a nest and four eggs of the species.

I find the Least Vireo (*Vireo belli pusillus*) very persistent in returning to the same clump of trees to nest, and have taken several sets within a foot or two of the spot where the nest of each previous year had been suspended.

The Plain Tit-mouse (*Baeolophus inornatus*) offers a good study along this line. While living at Palo Alto some years ago I had a pair that laid nicely spotted eggs, and I was able to collect two sets on successive years from this pair. The nest each time was built in the same cavity of a live oak. You can be sure that I would return and look at that hollow if I ever were near Palo Alto at the proper season, although the last set I took was ten years ago.

The Raptores offer the best and most easily followed of any of the orders. A pair of Golden Eagles (*Aquila chrysaetos*) I have in mind was watched quite closely for eighteen years. The female of the pair when first encountered was quite old and very white. After a number of years the type of eggs suddenly changed and a dark colored bird was found in possession of the home. The old female can still be seen hunting by herself just off the old range, being easily

identified by the large number of white feathers. She has been divorced for the past ten years and is apparently living a single life.

Many other species and pairs could be cited, but as yet we have only circumstantial evidence on which to base the conclusions set forth in the first paragraph.

Escondido, California, November 15, 1918.

PARASITISM OF NESTLING BIRDS BY FLY LARVAE

By O. E. PLATH

DURING the summer of 1913, while studying bird life in and about Berkeley, California, I fed up some fifty to sixty wild-taken nestlings which included the following species: California Purple Finch (*Carpodacus purpureus californicus*), California Linnet (*Carpodacus mexicanus frontalis*), Willow Goldfinch (*Astragalinus tristis salicamans*), Green-backed or Arkansas Goldfinch (*Astragalinus psaltria hesperophilus*), Lawrence Goldfinch (*Astragalinus lawrencei*), and Lazuli Bunting (*Passerina amoena*). In most instances these nestlings were taken a few days before they were full-fledged, together with nest and surrounding branches. Before being taught to eat by themselves, they were fed by means of a curved stick in bird fashion, that is to say not forcibly, but by making them realize that they could get food from the beak-shaped end of the stick as they did formerly from the beaks of their parents. This method of feeding usually extended over a period of from several hours to several days, depending upon the age and intelligence of the nestlings.

After having succeeded in feeding up several broods without loss, I attempted to rear a nest of five Green-backed Goldfinches, but despite the fact that all five ate readily from the stick, all but one died in a few days. On taking this nest of goldfinches, I had noticed that two or three of the nestlings had swollen eyelids, in some cases swollen to such an extent that it was impossible for the nestlings to open their eyes. Just previous to this time I had contracted a severe case of oak poisoning while roaming through the underbrush in the canyons and along the creeks, and thought that perhaps the nestlings might be afflicted with the same malady. While feeding them, I had noticed furthermore that their mouths were considerably paler than those of the birds which had been fed up previously. They also appeared less vigorous and did not exhibit the same ravenous appetite which healthy nestlings show. Their mouths became paler and paler and within two or three days four of the nestlings died, as I have already mentioned, and even the remaining one looked as though it would not live long. In order to keep it warm, I removed it from the nest and placed it in some warm woolen cloth. To my surprise I noticed a number of maggots, similar in size and form to bumble-bee larvae (about 1.5 cm. in length and 0.5 cm. in width), crawling about in the nest. Upon picking the latter apart, I found some twenty or thirty of these maggots. They were creamy white in color and the anterior end of the alimentary canal of a number of them contained a bright red substance which changed to a blackish brown color in the posterior part of the intestinal tract. The other maggots contained the same blackish brown substance, but not the red.

The pale mouths and ultimate death of the nestlings were no longer a mystery. They had been gradually bled to death by the maggots. I regretted the unhappy fate of the young songsters and avenged them as best I could by killing the maggots, thinking that this form of parasitism was no doubt generally known to zoölogists. The surviving nestling soon recuperated and later became a great pet of the family.

Intermingled with the lower part of this infested nest there was a mass of a sticky, dark brown substance reminding one of clotted blood. Evidently this material either was the faeces of the maggots or coagulated blood which had trickled from the wounds made by the maggots, but as I could find no trace of wounds on the birds, I concluded it to be the former.

About two weeks later I found the nest of a Willow Goldfinch containing four young ones, some of which showed the same symptoms as the Green-backed Goldfinches which had died. Suspecting that this nest also might be infested by maggots, I transferred the four nestlings to another nest and closely examined their own nest. I found the same state of affairs as in the previous infested nest, with the exception that some of the maggots had already pupated. These pupae were of a light brown color and somewhat smaller than the maggots, being about 1.0 cm. in length and 0.5 cm. in width. Both maggots and pupae were destroyed as in the first case. The swelling of the eyelids soon disappeared and I had no difficulty in rearing this brood of goldfinches; but one of the young birds turned out to be entirely blind so that it had to be killed. Two others were blind in one eye, whereas the fourth was normal. Two of these birds lived in captivity for several years.

Later in the summer I met Dr. C. A. Kofoid, head of the Zoölogical Department of the University of California, and told him about the maggots and the pupae. He regretted that I had destroyed them and suggested that I look into this matter more closely the followng summer. It was impossible for me to do this, however, until the summer of 1917. The period of investigation which I am now about to discuss, extended from the latter part of June, 1917, until about the middle of September. The work was carried out under the supervision of Professor W. W. Cort, of the Department of Zoology of the University of California, to whom I am indebted for a number of important suggestions.

My first task was to see whether or not I could find any maggots. Since both infested nests had been those of goldfinches, I tried to locate as many of these nests as possible. Incidentally I also kept an eye on nests of other birds which I chanced to run across. My efforts were quickly rewarded. The first nest examined, that of a Nuttall Sparrow (*Zonotrichia leucophrys nuttalli*), contained thirty-six full-grown maggots like those encountered in the summer of 1913, and thereafter I found them in about two out of every three nests.

To my surprise none of the young birds from these infested nests showed any eye trouble; nor did they, in the first few instances, seem to have fared any the worse in other respects from the presence of the maggots. Equally surprising was the fact that no red appeared in any of the maggots taken from the first few nests, but merely the dark brown substance in the posterior part of the intestine. Ninety of the most vigorous maggots, selected from 154 full-grown individuals taken from the nest of a California Linnet, whose five full-fledged young showed no noticeable pernicious effects from this large number of creeping vermin, were placed in a Green-backed Goldfinch nest containing three young which were about four or five days old, and developments observed from day to day.

One of the nestlings died about two days later. Though it seemed plausible that death had been caused by the maggots, a post-mortem examination furnished no absolute proof for this assumption. The other two nestlings seemed to be considerably retarded in their growth, but finally left the nest. After the departure of the young, only forty-three of the ninety maggots were recovered from the nest, some of them in the form of pupae, showing that many of them had evidently lost their bearings and fallen out of the nest. None of them showed any trace of red. These facts made my former conclusions, that these maggots were blood-sucking parasites, appear doubtful.

About this time I was observing two California Linnet nestlings. Despite the fact that there were only two young instead of from three to five, as is usually the case, I noticed that they were growing very slowly and that they lacked the same vigor and liveliness usually exhibited by this species of bird. When I finally succeeded in getting them to take wing, I obtained fifty-four maggots from their nest, many of which showed the sought-for red substance similar to that observed in 1913. These maggots were only about two-thirds the size of those taken from the first few nests, but to all appearances belonged to the same species.

At the laboratory several of the maggots with the red substance in them were decapitated and smears made from this red material which was then examined under a high power microscope. The red substance proved to be fresh vertebrate blood which of course could only have been obtained from the birds inhabiting the nest. But in order to prove this beyond a doubt, a number of additional experiments were carried out.

A few days later I obtained twenty exceedingly small maggots from a California Linnet nest just vacated by its feathery occupants. Although only about one-fourth grown, every one of them showed traces of fresh blood. All twenty were placed in the nest of a Green-backed Goldfinch containing three young about ten days old and the latter observed from day to day. Nothing extraordinary happened, excepting that the three nestlings seemed to be rather weak when they left the nest about two weeks later. When the nest was picked apart, all twenty maggots were recovered. They had meanwhile reached full growth. None of them however showed any trace of blood, but merely the usual dark brown substance in the posterior end of the intestine. These facts tend to indicate that the maggots are voracious feeders during the earlier period of their existence, but that they refrain from taking food after they have attained full growth.

As probable as it seemed that the vertebrate blood found in the maggots was avian blood obtained from the nestlings, this had not yet been absolutely proved, since I had never seen any of the maggots attached to the nestlings. Moreover my experiments up to that time, due to the difficulty of closely observing nestlings of wild birds in the open, had naturally been somewhat superficial. In order to remedy this difficulty, I decided to use a brood of tame canaries for subsequent experiments. I succeeded in securing a female bird with two nestlings about a week old, but both young died within a few days, probably because they had taken cold while being transferred to my room. For these I substituted four, nearly full-fledged Green-backed Goldfinches. The old bird seemed to notice the deception, but when she saw the four open, hungry mouths, she adopted the strangers as her own. A few days later I selected from some 200 maggots, forty of the most active ones and placed them on the young birds. The maggots

had been without food for a number of days and many of them were only half grown.

At first the nestlings showed some uneasiness by shaking themselves, but this only lasted for a minute or two, after which they again came to complete rest. They were observed from time to time until about 8:30 in the evening, but there was nothing unusual in their behavior. At about three o'clock the next morning I was suddenly awakened by a thud in the cage. My first thought was that the mother bird had become frightened and had jumped from the nest; but when I looked, I found one of the nestlings down below. I was still more surprised to see the others, including the old bird, sitting on the rim of the nest and not huddled closely together in the center. When I picked up the nestling which had leaped down, I noticed two maggots crawling about at the bottom of the cage, but upon examination found no maggots on the bird itself. The two maggots which had been dragged down by the nestling—it being impossible for them to get out of the nest-box in any other way—were not full-grown and were gorged with blood. Thereupon the four remaining birds were carefully examined.

I now saw what I had been expecting to see: A number of maggots were clinging to the feet and lower parts of the body of each one of the nestlings. None were found on the mother bird. Most of these maggots released their hold while the birds were being examined, but some of them had to be forcibly detached. These, like those found at the bottom of the cage, were not full-grown but were filled with fresh blood. No marks, visible to the naked eye, could be seen where the maggots had pierced the skin of the birds, nor were any traces of blood apparent. This was conclusive proof that the sticky material found at the bottom of infested nests is not coagulated blood which has dripped from the wounds made by the maggots, but faeces deposited by the latter. The four nestlings were then transferred to another nest and their own carefully examined. Sixty-eight maggots were taken from the nest, showing that the nest had originally harbored twenty-eight. More than half of the sixty-eight maggots showed traces of fresh blood, the smaller ones being most gorged. The soft cotton lining of the nest-box was then removed and carefully examined, but no additional maggots were discovered. Thereupon the box was refilled with cotton and the nestlings put back. The latter now appeared completely at ease. They again huddled closely together as formerly, the mother bird sitting on them during the night.

During the next few days a number of other experiments were carried out with this brood of goldfinches. While one of them was being held in the hand a few vigorous, half-grown maggots were placed among the nestling's feathers. After crawling about among them for a brief period, the maggots would invariably drop from the bird. One evening several dozen half-grown, hungry maggots were placed in a pasteboard box and covered with a layer of soft cotton about an inch thick. Two of the nestlings were then transferred to this box and the latter covered up. In less than ten minutes eight or nine of the maggots were found firmly attached to the nestlings, ingesting blood, only a few releasing their hold while the birds were being examined. This same experiment was tried the following afternoon, but, strange to say, none of the maggots were attached to the birds. But when this experiment was repeated the same evening, and on subsequent evenings, some maggots were again found clinging to the nestlings. This indicates that they do their deadly work at night and rest in the lower parts of the nest during the day. It is interesting to note that both of the nestlings which

were used for these experiments died several days later, apparently from loss of blood.

During the eleven weeks over which this investigation extended, the maggots and the resulting flies, since identified as the larvae and adults of *Protocalliphora azurea* (Fallen) by Mr. C. W. Johnson, curator of the Boston Society of Natural History, were studied carefully. These larvae were kept in pasteboard boxes, in some of which soft cotton or bird nest material was placed. They crawled about vigorously until they reached a dark place, the crevices between the layers of paper of the boxes being their favorite resting place.

In these pasteboard boxes various organic substances were placed, such as fruit, bread, meat, and boiled potato. Although the fly larvae crawled through some of these substances, they fed upon none of them. One day I secured a large bone containing many blood cavities. Among these blood cavities I bored several holes with my penknife and placed the bone in a box containing several dozen fly larvae. The latter had been starved for about a week so that there was not the slightest trace of food left in their intestines. The next morning I found two or three of them with fresh traces of blood in their alimentary canals, conclusive evidence that they had been feeding upon the ox blood contained in the bone. One day, having accidentally cut myself, I put several drops of blood in the palm of my hand and placed several larvae near it, but the latter invariably crawled in the opposite direction as soon as they came in contact with the blood. Similar experiments with ox blood brought the same results. This seems to indicate that the larvae require a firm object to which they can attach themselves before they make any attempt to ingest blood.

Larvae which had not reached their full growth when taken from nests invariably died, unless they could feed upon blood. On the other hand full-grown larvae always pupated, even if they had no access to food of any kind. This shows that the larvae of *Protocalliphora azurea* are absolutely dependent upon blood in order to mature.

The blood ingested by the larvae is stored in a kind of reservoir, the diverticulum, which branches off from the esophagus close behind the pharynx and there retains its red color for three or four days, gradually passing into the posterior end of the intestine as a dark brown substance which appears as a longitudinal streak in the middle of the animal's body. If the larvae are not fed, this streak is gradually discharged as faeces so that after five to seven days more, the larvae become creamy white in color throughout. From this we may infer that it is not necessary for the larvae to replenish their supply of food at frequent intervals to attain full growth.

When the larvae are about to pupate, they crawl, anterior end downward, into the sticky mass at the bottom of the nest and there sometimes form a kind of disk, the lower side of which is made up of the anterior ends of the larvae, and the upper side of the posterior ends. About two weeks after pupation, the young flies emerge from the lower side of the disk. The whole thing reminds one somewhat of the state of affairs in wasp nests. Here too the young wasps emerge from the lower side of the disks. In captivity the fly larvae, before they pupate, usually attach themselves to objects located in dark places by means of a viscous fluid which solidifies a few moments after it has been discharged.

One thing which surprised me very much was the power of resistance which these larvae showed. Several of them, after having been immersed in a 70 per-cent alcohol solution for twenty-four hours, were still wriggling vigorously. Sev-

eral others which were being prepared for dissection were placed in a fixing fluid for six hours, then washed in a 50 percent alcohol solution and placed in one of 80 percent. They were still alive two days later and it was necessary to resort to a stronger fixing fluid (Gilson's) to prepare them for dissection. Other larvæ were placed in a very strong insect powder, but they remained alive in it for two or three days.

As soon as the larvae pupated, the pupae were placed beneath inverted tumblers. After the flies emerged from the pupae they were kept in a large, narrow-mesh cage and carefully studied. It may be of interest to state that the flies (about 1500), practically without exception, emerged from the pupae between seven o'clock in the morning and two o'clock in the afternoon. Upon emerging they were of a slightly lighter hue than the adult of our Common House-fly (*Musca domestica*), their wings being shriveled up, but after about an hour or so these straightened out and the young flies assumed the dark blue, metallic lustre of adult *Protocalliphora azurea*.

Various kinds of food were placed before these flies, such as milk, crushed fruit, cheese, and meat in various forms. The flies readily ate the milk and fruit, especially if the latter was placed on the cage wire instead of the cage floor, but they were rather indifferent to the meat and the cheese. Although some of the flies were kept in the cage for six or seven weeks, none of them, to my knowledge, deposited eggs or maggots.

One day I noticed a number of very small, bee-like insects, since identified as *Nasonia brevicornis* by Professor Brues of Harvard University, flitting about in one of the inverted tumblers. I wondered where they had come from, but thinking that they had perhaps got into the tumbler accidentally, I let them escape. To my surprise I found some twenty or thirty more of them under the same tumbler the following day. Upon investigation, I found one or two small holes of about the size made by an ordinary stick-pin in several of the pupae. I could easily tell by the weight of the latter that they were empty. This gave me a clue. I opened a number of the pupae and there found these little insects, more commonly known as Chalcid Flies, in several stages of development: as white, inactive maggots; as creamy, pink-eyed larvae, already showing their insect form; and as full-grown insects which came swarming out as soon as the fly pupae were opened. I counted the Chalcid Fly larvae from a dozen pupae and found them to vary in number from about fifteen to twenty-five per Muscid pupa. In all these cases the embryo fly had been completely devoured.

Some forty or fifty of these Chalcid Flies were then transferred to an inverted aquarium jar below which a hundred Muscid pupae were placed. The Chalcid Flies seemed to be perfectly at home among these pupae, crawling about among them as do bumble-bees among their honey-combs. Within a few weeks hundreds upon hundreds of young Chalcid Flies emerged from the Muscid pupae; less than a dozen *Protocalliphora* hatched, the remaining ones having been parasitized by the *Nasonia*.

In some of the infested birds' nests, I had noticed a number of small grubs, similar in size and form to those found in almonds. As in the case of the Chalcid Flies and the larvae of the *Protocalliphora*, I paid no attention to them at the beginning, but when they occurred repeatedly, I began to suspect that they might have some relation to one or both of the other insects. I therefore collected some fifty or sixty of these grubs and placed them among a large number of Muscid pupae, many of which were parasitized by Chalcid Flies, and watched

developments from day to day. I found that these grubs fed upon the pupae, eating shell and all, and apparently being quite indifferent as to whether the pupae contained Chalcid Fly or Muscid larvae.

From these grubs several species of moths hatched. A few living specimens of these moths were turned over to Professor Wheeler of the Bussey Institution for identification, together with some *Nasonia brevicornis* and *Protocalliphora azurea*. It was necessary to send the moths to the United States Bureau of Entomology at Washington, where they were partially identified by Mr. Carl Heinrich. Among them were two species of *Tinea*, one of which was definitely identified as *Tinea occidentella* (Chambers). There was only one specimen of the other species and that was too badly rubbed for specific determination. A specimen of another species proved to be an Oecophorid, probably *Endrosis lacteella* (D. & S.), or a closely related species, but also too badly rubbed for exact identification. Several of these moths were retained for the United States entomological collection by the entomologists at Washington.

It will now perhaps be of interest to ornithologists and entomologists, as well as to bird lovers in general, to state how frequently the larvae of *Protocalliphora azurea* were encountered in birds' nests and what effect their blood-sucking habit has on the nestlings. During the eleven weeks in which these experiments were carried on, no less than sixty-three nests, representing six species of birds, were examined. Of these, thirty-nine, or nearly two-thirds, were infested by blood-sucking fly larvae. The following tables will help to illustrate.

TABLE I

Species of bird	Nests examined	Infested nests	Uninfested nests	Percentage of infestation
Nuttall Sparrow	4	4	0	100
California Purple Finch and California Linnet	31.	21	10	67
Green-backed Goldfinch	13	8	5	61
Willow Goldfinch	7	4	3	57
California Brown Towhee	8	2	6	25
Totals	63	39	24	61 (Average)

TABLE II

Species of bird	Larvae in each nest	Totals	Larvae per nest
California Purple Finch and California Linnet	8, 10, 14, 15, 17, 20, 23, 29, 50, 52, 54, 60, 62, 71*, 86, 94, 103, 103, 106, 108, 154.	1239	59
California Brown Towhee	44, 62.	106	53
Willow Goldfinch	13, 24, 34, 81.	152	38
Nuttall Sparrow	24, 36, 36, 37.	133	33
Green-backed Goldfinch	13, 18, 19, 21, 28, 30, 35, 50.	214	26
Totals		1844	47 (Average)

*A considerably smaller, but apparently more deadly species than *Protocalliphora azurea* (Fallen).

From the first table it will be noticed that birds which build a rather compact nest, for example the goldfinches and the linnets, show a considerably larger proportion of infection than those which construct nests of a looser texture, as for instance the California Brown Towhee. This may possibly be due to the

fact that it is difficult for the fly larvae to keep from falling out of loosely constructed nests.

All of the 1844 larvae in Table II, excepting the seventy-one indicated by the starred foot-note, were those of *Protocalliphora azurea.* These seventy-one larvae were taken from a linnet nest which contained the skeletons of three young which had been overtaken by death just before they became full-fledged. Death had undoubtedly been caused by the larvae. When the latter were discovered, they were in their pupal stage and were considerably smaller than the larvae of *Protocalliphora azurea.* All of them, excepting about a dozen, had hatched. These unhatched pupae were guarded very carefully, but they all proved to be parasitized by *Nasonia brevicornia.*

The death of six other nestlings, including the four which had died in 1913, could be traced with more or less certainty to the Muscid larvae, as in the case of the three linnets whose skeletons I found, and the two goldfinches used for experimenting. One of these nestlings, a nearly full-fledged California Linnet, was discovered when it had been dead only a short time. A number of the *Protocalliphora* larvae had actually penetrated into its body. The nest in which this dead bird was found contained another nestling of the same brood. Though apparently rather weak, this nestling took wing when I approached the nest. Nearly all of the fly larvae found in this nest showed traces of fresh blood.

It was not until after I had completed my investigations that my attention was called to two articles concerning blood-sucking fly larvae[1]. As far as I am able to ascertain, these are the only two instances of blood-sucking fly larvae on record as far as North America is concerned. In the second of these two articles Coutant mentions four papers (those by Dufour, Du Buysson, Rouband, and Rodhain) concerning blood-sucking fly larvae in Africa, South America, and Europe, but neither the Harvard University Library nor the Boston Public Library contain any of these four articles.

In 1908 Henshaw (*loc. cit.*) recorded the infestation of two successive broods of Bluebirds (*Sialia sialis*) by the larvae of *Protocalliphora chrysorrhea* (Meigen), which had been reported to him by Mrs. Emma F. Everett, of Wellesley Hills, Massachusetts. These two cases of parasitism were decidedly fatal, seven out of the eight nestlings dying as a result. Henshaw closes with a note of warning about the danger of this insect pest to our native birds.

Seven years later Coutant (*loc. cit.*), while studying blood parasites of the Common Crow (*Corvus brachyrhynchos*) at the Biological Laboratory of Cornell University, came across some larvae of *Protocalliphora azurea.* Most of his deductions, based upon the study of these larvae, are well founded. His conclusion however (*loc. cit.*, p. 139) that "the larvae prefer rather dry places to moist ones and are therefore not accustomed to living in decomposing or fecal material" and that (*loc. cit.*, p. 143) "the larvae when ready to transform, apparently leave the more occupied parts of the nest in the vicinity of their food-supply and seek a dry . . . portion" of the nest, were not borne out by my observations and experiments. In all cases the larvae preferred the moist faecal material and pupated in it. This discrepancy between Mr. Coutant's results and mine is undoubtedly due to the fact that Mr. Coutant based his conclusions upon the study of a comparatively few larvae, and that even these few were not studied by him in their natural environment, the bird's nest.

[1]a. Henshaw, H. W. A Parasitic Fly Injurious to our Native Birds. The Auk, xxv, 1908, pp. 87-88. b. Coutant, Albert F. The Habits, Life History, and Structure of a Blood-sucking Muscid Larvae (*Protocalliphora Azurea*). Journal of Parasitology, vol. I, 1915, pp. 135-150.

Commenting upon the fact that *Protocalliphora azurea* is recorded by collectors and dipterologists as "rare" or "very rare" and that specimens of this fly are only to be found in the larger museums and collections, Coutant correctly assumes (*loc. cit.*, pp. 144, 145) "that they are not so rare as is generally supposed, but that the adults are peculiar in their habits, flight, etc., and for this reason are rarely taken". He then goes on to say (*loc. cit.*, p. 145): "Few collectors, I imagine, have taken insects very often from the zone of air from fifty to one hundred feet above the ground, in the woods; yet from the habits of the larvae, this is where we would naturally expect that the adults would occur". This is probably correct, but the lower limit, as well as the lateral, will have to be extended considerably. Most of the thirty-nine infested nests taken during the course of my experiments, as well as the two encountered in 1913, were found far distant from forests and all of them came from a height of three to fifteen feet above the ground.

Turning now to the effect which these blood-sucking larvae of *Protocalliphora azurea* have on nestling birds, my observations seem to warrant the following conclusions: (1) that from 5 to 10 percent of the parasitized nestlings die from loss of blood; (2) that some of the parasitized nestlings which do become full-fledged are so weakened by the loss of blood that they fall an easy prey to rapacious animals; (3) that the larvae of *Protocalliphora chrysorrhea* are probably more deadly to nestling birds than those of *Protocalliphora azurea*. The last conclusion seems to be borne out by the case of parasitism recorded by Henshaw (*loc. cit.*, pp. 87-88), where there was a fatality of nearly 90 percent instead of one of only 5 to 10 percent.

Much remains to be done along this line of investigation in order to determine how large and universal the damage is which is wrought on our continent by this insect pest. Although the adults of both *Protocalliphora azurea* and *Protocalliphora chrysorrhea* are very rarely taken by collectors (*cf.* Henshaw, *loc. cit.*, p. 88; Coutant, *loc. cit.*, pp. 144-145), my investigations prove conclusively that the former is not so rare, at least not in certain parts of the country. So far, however, only forty-four birds' nests, infested by the larvae of one or the other of these flies, have been recorded. All forty-four of these infested nests were found at three places, one near Ithaca, N. Y. (Coutant, *loc. cit.*), two at Wellesley Hills, Mass. (Henshaw, *loc. cit.*), and the remaining forty-one in the San Francisco Bay region. It would be highly interesting, and perhaps for the benefit of our wild birds, if bird students in other parts of the United States, as well as in Canada and Mexico, would thoroughly investigate this matter in their home districts.

Massachusetts Institute of Technology, Cambridge, Massachusetts, May 7, 1918.

FROM FIELD AND STUDY

The Costa Collection of Birds.—In The Condor for May, 1918, pages 114-116, Dr. T. S. Palmer has carefully reviewed the early history of *Calypte costae*, and ends with the phrase, "The Costa collection of hummingbirds, the fate of which is now unknown." Adolphe Boucard in his "Genera of Humming Birds," London, 1893-1895, under *Calypte Costae*, page 5, states: "This fine species was dedicated to Marquis Costa de Beauregard, who was a very enthusiast[ic] collector, and had in his time one of the finest collection[s] of Humming Birds. . . . I bought his collection in 1878, and I found among many rare species, what I consider as the types, male and female of this species."

Boucard, who was one of the ablest of French ornithologists and the last of the great natural history agents who made Paris their headquarters in the nineteenth century, moved to London I think in 1889, where I frequently saw him in the years 1889-1891, at his natural history agency in High Holborn. He made two notable donations of the greater part of his ornithological collection to the Paris Museum, the first I think in 1895, and the last in 1904, a few months before his death. It is probable the supposed types of *Calypte costae* were in the first donation, as Boucard had then finished his "Genera of Humming Birds."

In the Atlas, "Voyage de la Frégate la Vénus," Bourcier's types are figured (Oiseaux, pl. 2, figs. 1, 2), in colors from a painting of the male and female by Oudart.—J. H. Fleming, *Toronto, Ontario, October 25, 1918.*

The Wilson Phalarope in the San Diegan Region.—An adult male of the Wilson Phalarope (*Steganopus tricolor*) was taken at Nigger Slough on September 16, this year (1918). The species has been recorded from Santa Barbara at sea level, otherwise its occurrence in the low country of the San Diegan region is quite worthy of note. The bird was alone, though Northern Phalaropes came and went from time to time. The plumage is the quiet gray of winter with some persisting wing quills that were worn. The testes were well defined but shrinking in size. This completes the roster of the American phalaropes that I have taken this September in the low country of this region. —Loye Miller, *State Normal School, Los Angeles, California, September 23, 1918.*

Nesting of the Western Willet in California.—In a recent conversation the Editor of The Condor called my attention to the fact that there is only one definite record of the breeding of the Western Willet (*Catoptrophorus semipalmatus inornatus*) within the state of California. This is based upon sets of eggs collected by N. R. Christie, near Beckwith, Plumas County, many years ago. It, therefore, seems well worth while to record the taking of additional eggs of this bird within the state.

During June and July, 1918, Dr. Barton W. Evermann, Mr. Joseph R. Slevin and myself made a long collecting trip by automobile, covering some 1800 miles, through northern California and southern Oregon. In early June we spent several days at a partially flooded mountain meadow known as Grasshopper Meadow or Grasshopper Lake. This is situated in Lassen County about five miles from Eagle Lake.

Grasshopper Lake is very shallow. The relative proportion of lake and meadow varies much from time to time, according as the season is one of more or less moisture. Together they cover many hundred acres. At the time of our visit the immediate shores of the lake were wide mud flats with a scattering, sprawling growth of a thick-stemmed, ragged, more or less vine-like "red-weed". Farther from the lake were meadows of sedges and grasses and a wide belt of yellow primroses, and then rolling hills covered with sage-brush.

As we reached the mud flats a number of large birds with very conspicuous white wing-patches rose in the air and, with loud cries, came driving toward us, passed, wheeled and came again and again, in very much the manner of an Avocet. There seemed to be no reason to doubt that they were the Western Willet, but, to make identification certain, one was shot. There seemed to be about six or eight or perhaps ten pairs here, and later we saw four or five more pairs in another part of the meadow several miles away. We succeeded in finding five nests. On June 1 Dr. Evermann found two nests, with one and two fresh eggs, and on June 6 I found three nests, one empty, one with four broken

eggs, and one with four eggs in which incubation had begun. The nests were made of pieces of weeds rather carelessly built up on the mud. Some were found where the water was a few inches deep and some where the mud was drying. The one with broken eggs was on a clump of "red-weed" where the receding water had permitted complete drying. The broken eggs apparently had been eaten by some mammal or bird.

The sets of one and two eggs collected by Dr. Evermann are now in the collection of the California Academy of Sciences. The set of four is in my collection.—J. VAN DENBURGH, *San Francisco, December 6, 1918.*

Nighthawk Observed in San Francisco.—On the evening of September 18, 1918, I happened to be standing at my bedroom window, on the upper floor of the house, absentmindedly looking at the sky, when what appeared for the moment to be a far distant but exceedingly erratic sea-gull came above the horizon and at once attracted my attention. Numerous gulls had been flying over without especial notice, but this individual seemed to have gone crazy as it flew into the west, or else was forgetting how to fly. Just when it nearly disappeared from view it suddenly turned and flew back almost directly overhead, disclosing the fact that instead of being a gull it was a nighthawk. The white wing bars were visible, yet it was not possible to locate their position accurately enough to state the species, but it was presumably a Pacific Nighthawk (*Chordeiles minor hesperis*). On looking at my watch it was exactly 7:20 P. M. The incident was noted down as a matter of interest and as a record of date.

Three nights after this, that is, on September 21, I happened to be at the same window at the same moment, and across the sky flew the same, or another, nighthawk, again proceeding westward. This time it did not turn, but disappeared in the western sky. I went out into the street to have a wider view, but saw nothing further. Impressed by this repetition the next evening saw me early in the street, and on the lookout for more developments. At precisely 7:21 a nighthawk appeared in the east and pursued the same course as before, again disappearing toward the ocean. Each time the bird's course was about over and parallel with Pacific Avenue or Broadway. The next few evenings were foggy or lowering and the bird was not seen again.—JOSEPH MAILLIARD, *San Francisco, October 1, 1918.*

Notes on Red-headed Woodpecker and Jack Snipe in New Mexico.—In a recent issue of THE CONDOR were published notes made by several New Mexico ornithologists on the occurrence of the Red-headed Woodpecker (*Melanerpes erythrocephalus*) in this state. It was pointed out that all the birds so far observed had been on or near transcontinental railway lines, indicating that the movement across treeless plains had followed the lines of telegraph poles. It might be of interest to add that on August 18, *1918, at a point about four miles north of Albuquerque, and within a quarter of a mile of the main line of the Santa Fe Railway, I observed an additional adult Red-head. I approached within twenty feet of the bird so that there can be no question whatever of identification.*

On the same day I also observed four Jack Snipe (Gallinago delicata) in the same locality. These birds were so tame and unsuspecting that I was led to believe that they had been raised in the locality. I do not know whether Jack Snipe have been known to breed at this altitude (5000 feet) in New Mexico, but this record indicates that they may be found here during the breeding season.—ALDO LEOPOLD, *Albuquerque, New Mexico, August 21, 1918.*

Nesting of the Band-tailed Pigeon in San Diego County, California.—I have recently received an egg of the Band-tailed Pigeon (*Columba fasciata*) taken on Palomar Mountain, San Diego County, on October 11, 1918. This was perfectly fresh and was the only egg in the nest, which was situated in a post-oak near the side of a road and was twelve feet above the ground. The average of 13 eggs given by Bendire is (as reduced from millimeters to inches) 1.57x1.13. His largest egg measured 1.72x1.20. This egg of mine measures 1.93x1.07.

I have the report of another egg taken in the same locality on October 14, incubation commenced. This, also, was in an oak about twelve feet above the ground. The

nest was unusually large, about 18 inches top diameter, 3½ inches thick; perfectly flat, no hollow. Elevation about 5000 feet above sea-level.

My informant tells me that the Pigeons are very numerous on Palomar Mountain and he believed that there were several more pairs nesting. He says the acorn crop is unusually large this year and that the elder and cascara bushes are loaded with berries, on both of which the pigeons largely feed. Probably the plentiful food supply and a warm open fall account for the late nesting. Possibly the fall may be the best time to find them nesting anyway. They are scarce enough in the spring and summer.—C. S. SHARP, *Escondido, California, October 27, 1918.*

Recent Additions to the California State List of Birds.—There was enumerated as of full standing in the 1915 "Distributional List of the Birds of California" (Pacific Coast Avifauna number 11) a total of 541 species and subspecies. Up to December 20, 1918, there have been no adequate reasons advanced for removing any one of these 541 forms from regular standing. On the other hand, there has been a total of 23 additional forms given full standing as birds of California on reasonably convincing grounds. These 23 additions are listed below, each with citation to place of proposal. It must be kept in mind that mere changes in names do not figure here—only distinct species or subspecies not included in the main 1915 list under any name whatsoever.

1. *Thalassogeron culminatus* (Gould). Yellow-nosed Albatross. This name is restored from hypothetical status because the determination of the skull upon which the earlier record was based has been authenticated. (See Loomis, Proc. Calif. Acad. Sci., 4th ser., II, 1918, pp. 84-85.)

2. *Oceanodroma leucorhoa kaedingi* Anthony. Kaeding Petrel. (See Miller, Condor, XX, 1918, p. 211.)

3. *Anser albifrons gambeli* Hartlaub. Tule Goose. (See Swarth and Bryant, Univ. Calif. Publ. Zool., XVII, 1917, pp. 209-222, pl. 13.).

4. *Numenius americanus americanus* Bechstein. American Long-billed Curlew. (See Oberholser, Auk, XXXV, 1918, pp. 189-190.) Oberholser ascribes *two* races of the Long-billed Curlew to California, of which *Numenius americanus occidentalis* is the more essentially western form and the one to which most previous records probably belong.

5. *Astur atricapillus atricapillus* (Wilson). Eastern Goshawk. (See Grinnell, Condor, XIX, 1917, p. 70.) Doubts have been expressed by L. B. Bishop and by P. A. Taverner as to the existence of two races of goshawk in America; but so far no adequate treatment of the problem has been published.

6. *Glaucidium gnoma pinicola* Nelson. Rocky Mountain Pigmy Owl. (See Grinnell, Condor, XX, 1918, p. 86.)

7. *Dryobates villosus leucothorectis* Oberholser. White-breasted Woodpecker. (See Grinnell, Condor XX, 1918, p. 86.)

8. *Selasphorus platycercus* (Swainson). Broad-tailed Hummingbird. Restored from hypothetical status. (See Swarth, Condor, XVIII, 1916, p. 130; Grinnell, Condor, XX, 1918, p. 87.)

9. *Muscivora forficata* (Gmelin). Scissor-tailed Flycatcher. (See Swarth, Condor, XVII, 1915, p. 203.)

10. *Aphelocoma californica immanis* Grinnell. Interior California Jay. (See Oberholser, Condor, XIX, 1917, pp. 94-95; Swarth, Univ. Calif. Publ. Zool., XVII, 1918, pp. 411, 415.)

11. *Aphelocoma californica oocleptica* Swarth. Northwestern California Jay. (See Swarth, Univ. Calif. Publ. Zool., XVII, 1918, pp. 411, 414.)

12. *Calcarius ornatus* (Townsend). Chestnut-collared Longspur. (See Grinnell, Condor, XX, 1918, p. 87.)

13. *Passerculus sandwichensis savanna* (Wilson). Eastern Savannah Sparrow. (See Clay, Condor, XIX, 1917, p. 68.)

14. *Passerculus rostratus guttatus* Lawrence. San Lucas Marsh Sparrow. (See Brown, Auk, XXXIV, 1917, p. 340.) I confess that I should like to see the whole *Passerculus* category of sparrows thoroughly revised on the basis of the most careful appraisement of age, sex and seasonal variation, as well as of geographical variation.

15. *Passerella iliaca monoensis* Grinnell and Storer. Mono Fox Sparrow. (See Grinnell and Storer, Condor, XIX, 1917, pp. 165-166.)

16. *Passerella iliaca brevicauda* Mailliard. Yolla Bolly Fox Sparrow. (See Mailliard, Condor, xx, 1918, pp. 138-139.)

17. *Pipilo maculatus montanus* Swarth. Mountain Towhee. (See Grinnell, Condor, xx, 1918, p. 87.)

18. *Vermivora virginiae* (Baird). Virginia Warbler. (See Grinnell, Condor, xx, 1918, p. 193.)

19. *Vermivora celata orestera* Oberholser. Rocky Mountain Orange-crowned Warbler. (See Oberholser, Auk, xxii, 1905, p. 244; Grinnell, Pac. Coast Avif., no. 11, 1915, p. 146.)

20. *Telmatodytes palustris aestuarinus* Swarth. Suisun Marsh Wren. (See Swarth, Auk, xxxiv, 1917, pp. 310-311.)

21. *Sitta carolinensis tenuissima* Grinnell. Inyo Slender-billed Nuthatch. (See Grinnell, Condor, xx, 1918, p. 88.)

22. *Penthestes gambeli inyoensis* Grinnell. Inyo Mountain Chickadee. (See Grinnell, Univ. Calif. Publ. Zool., xvii, 1918, pp. 506, 510.)

23. *Hylocichla guttata polionota* Grinnell. White Mountains Hermit Thrush. (See Grinnell, Condor, xx, 1918, pp. 89-90.)

With these 23 additions the total number of birds for California comes to 564. We are still decidedly behind Texas, with its 605 species and subspecies (see Oberholser, Condor, xix, 1917, p. 68); but we are steadily catching up!—J. Grinnell, *Museum of Vertebrate Zoology, Berkeley, California, December 20, 1918.*

A Northern Record of *Mimus polyglottos leucopterus*.—On the 28th of July, 1918, while returning by auto from a reconnaissance trip in Humboldt County, Nevada, we encountered two Western Mockingbirds on Duck Flat, at a point some miles northwest of Sunkist (formerly Duck Lake), Nevada. The occurrence was so unusual that I stopped the car and made sure of the birds' identity. The birds were straggling at some distance apart and appeared to be working their way slowly northward, fluttering from clump to clump over a luxuriant growth of sage. The record station is well above the forty-first parallel of latitude, and not more than six miles east of the California boundary line.—William Leon Dawson, *Santa Barbara, California, December 4, 1918.*

Sapsuckers and Hummingbirds.—In early June of this year (1918) I was collecting in the Moose Mountain District (southeast corner of Saskatchewan). This is a hilly district, thickly wooded, with numerous lakes and sloughs, surrounded by flat prairie—an "oasis in the desert". Near Fish Lake, each side of the trail, were a few birch trees among the poplars. I noticed that Yellow-bellied Sapsuckers (*Sphyrapicus varius*) had been at work on one of the birch-trees; some five or six rows of holes were made about twelve feet from the ground. As I looked at this tree, a Ruby-throated Hummingbird (*Archilochus colubris*) came to it, hovering in front of, and probing, the holes, feeding on the sap. I had never seen *colubris* thus feeding, and stayed at the spot a couple of hours to make observations.

Shortly a male Sapsucker came to the spot, drove away the hummingbird and commenced to feed, followed by the female who drove away her mate. Sitting partly hidden by the underbrush close to this tree, I noted that a hummingbird came, on an average, every ten minutes, a sapsucker every half hour. As I needed specimens of this usually scarce species, as well as desiring to know if it was the same two or three birds which were being attracted to this feeding place, I took (with .22 shot cartridges) six hummingbirds, four males and two females; but still others came to feed as before. This was between 8 and 10 A. M. Passing the spot on my way back about 5 P. M., I saw another, but had no time for further observations. Examination of the birds taken showed no signs of minute insects, but considerable clear liquid came from the mouth, which satisfied me the hummingbirds were *actually feeding on the sap*.—H. H. Mitchell, *Provincial Museum, Regina, Saskatchewan, October 25, 1918.*

Western Golden-crowned Kinglet in Los Angeles.—On November 27 of this year (1918), I picked up in my yard in the city of Los Angeles an adult male Western Golden-crowned Kinglet (*Regulus satrapa olivaceus*). From time to time during the past five weeks, the notes of this species have been heard in the locality, but no view of the birds was obtained until the above date when three times during the morning a small flock of them visited the premises, feeding in oak and sycamore trees. The elevation here is 500 feet above sea-level and constitutes the lowest point at which I have ever observed the species so far south as Los Angeles.—Loye Miller, *State Normal School, Los Angeles, December 10, 1918.*

EDITORIAL NOTES AND NEWS

It may not be amiss here to call attention to the fact that the lists of proposed changes in nomenclature of North American birds now being published from year to year in *The Auk* are not to be considered authoritative; in other words, they do not in any sense replace the Supplements formerly issued by the A. O. U. Committee on Nomenclature. As stated by the editor of *The Auk*, himself, in a recent issue of that magazine, these lists, although exceedingly useful to the technical student of birds, carry no authority further than that of the compiler's personal opinion, and no action has as yet been taken by the A. O. U. Committee on any of the cases contained therein.

The Audubon Association of the Pacific, with headquarters in San Francisco, has issued no. 1 of a monthly bulletin under the caption of "The Gull". This consists of four pages of announcements of meetings and field trips, reports of birds seen on field trips, and news notes of interest to members of the organization represented. While no editorial staff is indicated in connection with this first number, we think we see evidences here and there of the literary handiwork of the energetic President of the Audubon Association of the Pacific, Mr. C. B. Lastreto.

The publication of the Cooper Club military record which was scheduled to appear in this issue of THE CONDOR is now postponed till March issue. This is to give further time for securing important data still lacking in regard to certain of our men in service.

The vote is overwhelmingly in favor of continuing the Cooper Club membership roster as an annual feature of THE CONDOR. To be more explicit, the mail vote up to January 15 stands 24 to 5 against *dis*continuance. Numerous excellent reasons were advanced in the replies, to offset the plea for economy. The following extract from a letter to the Editor from Mr. John G. Tyler expresses the prevailing attitude in the matter. "To me the annual membership roster is one of the most valuable features of THE CONDOR. Frequently, when business has led me to other cities, I have taken with me the copy of our magazine containing the latest roster and when the day's work was over eagerly sought through the list for

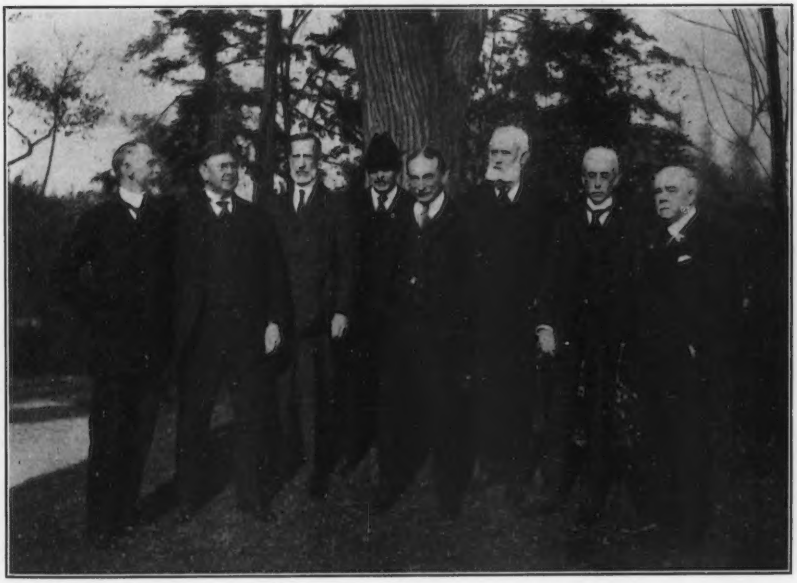

Fig. 11. COUNCIL OF THE A. O. U. IN ATTENDANCE AT THE THIRTY-FIFTH STATED MEETING, CAMBRIDGE, NOVEMBER 12, 1917.
FROM LEFT TO RIGHT: DR. J. DWIGHT, DR. A. K. FISHER, MR. JOHN H. SAGE, DR. FRANK M. CHAPMAN, DR. WITMER STONE, MR. WILLIAM BREWSTER, MR. CHARLES F. BATCHELDER, MR. RUTHVEN DEANE.

Photo by W. K. Fisher.

the address of some member upon whom I might call. Some of the most delightful and lasting friendships have had their beginnings when, wholly unannounced, some Cooper Club member has dropped in at my house with the 'apology' that he was passing through town and had seen my name in the Club roster and thought he would look me up. The value of this list is perhaps greatest to those of us who reside at some distance from the Club centers and are thereby deprived from attending meetings; for through it we can get in touch with other sequestered members in nearby towns. May the annual roster continue to grow until it appropriates not only ten but twenty pages of our magazine!"

A wonderfully interesting sketch of the history and accomplishments of the American Ornithologisists' Union appears in a late issue of *The American Museum Journal* (vol. XVIII, 1918, pp. 473-483). This is from the pen of Dr. T. S. Palmer, the new secretary of the Union, and includes among other notable features an assembled photograph of the founders and officers of the Union as they appeared thirty-five years ago. In this connection it is a pleasure to be able to present herewith a group of certain prominent A. O. U. members, as photographed by Walter K. Fisher at the 1917 A. O. U. meeting. Three of these, Dr. A. K. Fisher, Mr. William Brewster and Mr. Charles F. Batchelder, appeared in the group of 1883.

Cooper Club members and other ornithologists will be interested to learn that a movement has been started to establish an American Society of Mammalogists. The committee on organization consists of Dr. Hartley H. T. Jackson, Chairman; Dr. Glover M. Allen, Dr. J. A. Allen, Dr. Joseph Grinnell, Mr. Ned Hollister, Mr. Arthur H. Howell, Mr. Wilfred H. Osgood, Mr. E. A. Preble, and Dr. Walter P. Taylor. Incompleted plans call for an annual meeting, sectional meetings, and the publication of a magazine of both a popular and technical nature. Life histories, ecology, evolution, and other phases of mammalogy will receive attention as well as taxonomy. It is hoped that an organization meeting can be held this spring (1919). Anyone who desires to join or is interested in the organization may address the chairman of the committee, U. S. Biological Survey, Washington, D. C.

We are greatly pleased to be able to announce that favoring circumstances have permitted Mr. W. L. Dawson to again take up work on his *Birds of California*. The preparation of the text is now well under way, the gathering of the material for illustration having already been practically completed.

Avifauna no. 13 has gone to press—a pretty convincing piece of evidence that good times are indeed returning. This number is J. R. Pemberton's *Second Ten Year Index to The Condor*. The question has been raised as to the propriety of publishing such an index as one of the Avifauna series, instead of separately. Without going into the reasons here, it has seemed on the whole best to follow the precedent set when the first ten year index was issued, namely to give it a number in the Avifauna series.

PUBLICATIONS REVIEWED

A REVIEW OF THE ALBATROSSES, PETRELS, AND DIVING PETRELS [being contribution number 12 based upon the expedition of the California Academy of Sciences to the Galapagos Islands, 1905-1906], by LEVERETT MILLS LOOMIS. Proc. Calif. Acad. Sci., 4th ser., vol. 2, pp. 1-187, pls. 1-17; issued April 22, 1918.

We learn from the "historic sketch", which comprises chapter one of the paper under review, that Elliott Coues, of all previous authors, has contributed most importantly to our systematic knowledge of the Tubinares. His work, in the light of later developments, has proven most scholarly; yet the chief of his contributions was published in 1864 and 1866, when he had not yet attained his twenty-fourth year. Loomis thus at the outset pays appreciative tribute to the chief of his predecessors in the field he has chosen for his own special study.

Under the heading "geographic distribution", among the more striking generalizations is that barriers to pelagic species of birds are to be found in the limits of food-producing areas. While there is good reason for recognizing control by temperature also, a third factor of importance concerns historical circumstances. Loomis divides the oceanic portion of the earth's surface into "distribution areas", classified into three different grades, namely, *superarea*, *area*, and *subarea*, based on the occurrence of species at their breeding stations. These areas are demonstrated on the basis of the Tubinares of the world. Of the subareas there are twenty-five all told, and one of these is the "Californian Subarea", with six diagnostic species.

The subject of migration is gone into at some length. Interesting cases are described, of the long "transequatorial" emigrations of several of the shearwaters from the South Pacific to the North Pacific. There are also regular emigrations, though less extended as a rule, of species from the north-

ern hemisphere. ". . . Migration is simply an exodus, followed by a return movement to breeding grounds." ". . . Bird migration is the adjustment of the bird population of the world to the seasons . . . , the evolution of the seasons being the remote cause of bird migration." The more speculative portion of Loomis's paper, for example as to how migrating birds find their way, are stimulative, and will always need to be taken account of by future students in the field, but they leave the reader in darkness at many turns. We note, in this connection, that John B. Watson's conclusions are discounted. Loomis can see no good reason for ascribing to birds a sixth sense by which they can find their way. They are guided solely, in his opinion, by ordinary faculties intensified, plus an "innate desire to travel." An admittedly weak place in this guidance theory concerns the return-migration of birds nesting on remote oceanic islands.

The detailed descriptions of molts and plumages, based in many cases upon long series of specimens, constitute perhaps the most important feature of the paper. We are quite convinced that Loomis is right in placing in synonymy a number of names, the original characterizations accompanying the proposal of which include only points of color just such as is demonstrated in available material to be due to age, fading, or loss of "bloom". No one who in the future attempts to deal systematically with the Tubinares can allow himself to overlook these important factors; and to become thoroughly familiar with them requires a great amount of close study and an exercise of mature judgment.

In this connection, Loomis lays great stress on what appears to him to be in this order of birds a relatively very common state of double coloration, or "dichromatism". In certain cases he is inclined to look upon dichromatism as subject to geographic factors, so that a light phase of a given species might predominate or occur exclusively in one area, and a dark phase of the same species in another. Here we are tempted to believe that the dichromatism idea has become confused with that of true geographic variation, the latter leading to the origin of new species. Dichromatism undoubtedly does exist in certain tubinarine birds, but there is a chance that Loomis has inferred its existence in cases where adequate material is still lacking to completely establish the fact.

Mr. Loomis's special method of handling geographic variation leads him to place under the synonymy of *Oceanodroma leucorhoa* no less than five current names of petrels, namely *socorroensis*, *kaedingi*, *monorhis*, *beldingi*, and *beali*. This case illustrates his tenet that "the subspecies theory" is "discarded as a theory that has outlived its usefulness." In other words only full species are given systematic recognition, the criterion of intergradation, as here specially applied, serving as the basis of exclusion. Geographic variation is handled as of coordinate importance with age, sexual and seasonal variation. It is as if the process of evolution itself had been denied!

On the other hand we cannot but heartily commend Loomis's conservative stand in regard to the recognition of genera. The futility of repeated subdivision of genera down to the only logical limit, the one-species genus, is well set forth. There can in our mind be little well-grounded defense of the principle lately put into practice by Mathews and others whereby it is concluded that two species occupying the same area must *ipso facto* belong to two separate genera.

Cooper's California record of the Yellow-nosed Albatross (*Thalassogeron culminatus*) on the basis of a skull found on the seabeach near San Francisco is corroborated by Mr. Loomis. The skull, with bill largely intact, was carefully examined previous to its destruction in the fire of 1906. The species thus becomes re-instated on our regular list of California birds, it having heretofore reposed among the hypotheticals. Cooper's record of the Giant Fulmar from Monterey is not, however, credited.

Several tubinarine birds are recorded from the high seas some hundreds of miles off the coast of California whose names do not appear on our state list nor even on the North American list. Of course the limits of a state with a sea coast can only be set at a greater or less distance offshore in arbitrary fashion, but it would seem to the undersigned that they should not extend beyond say one hundred miles outside the headlands or outermost islands. It is perhaps a somewhat different matter as regards inclusion in the North American list.

The care displayed throughout in grammatical construction, spelling and final proof-reading, has resulted in a production well-nigh above criticism from these standpoints. Indeed, it may be stated with some assurance that no ornithological paper has appeared in years so free from typographical

blemishes. But that absolute perfection is beyond human reach is occasionally demonstrated even in the present painstaking product. For example, grammatical lapses in the following quotations from page 164 are apparent: "The duties of incubation were shared by both sexes; in two instances the male was setting and in three the female."

Whatever of misgiving may be aroused in the mind of the reader of Loomis's paper in regard to some of the theoretical interpretations and to the peculiarity in handling geographic variation, the paper must be commended for the extraordinary care exercised in gathering and publishing the multitude of facts therein made available in regard to the relatively little known Tubinares.—J. GRINNELL.

THE HAWKS OF THE CANADIAN PRAIRIE PROVINCES IN THEIR RELATION TO AGRICULTURE, by P. A. TAVERNER. Canada Geological Survey, Museum Bulletin No. 28, Biological Series no. 7, August, 1918, pp. 1-14, 4 plates (8 colored illustrations), 7 figs. in text.

It is to be hoped that this bulletin will be given the widest possible circulation, especially among the farmers of the region covered, for although the treatment of the subject is necessarily of the briefest, the author has nevertheless compressed within these few pages much accurate information upon a generally misunderstood subject. The written descriptions and the illustrations should together suffice for ready identification of the species by the layman, and the nature of the food of each is concisely indicated. Emphasis is rightly placed upon the harmlessness of most hawk species, as regards human interests, and the absolute benefits accruing to the farmer through the activities of many of them.

Such educational work as this is valuable and should be pushed farther. It has been neglected in the past with results familiar to all ornithologists. The fate of the White-tailed Kite in California and of the Mississippi and Swallow-tailed kites in Illinois are fair examples of what is happening elsewhere throughout the country,—the destruction of beautiful and harmless birds through ignorance and thoughtlessness. Printed matter calculated to offset such action is of the scarcest, and seldom reaches the individual who should be convinced of the error of his ways. Of United States government publications, the one and only report adequately covering the subject, Dr. A. K. Fisher's *Hawks and Owls of the United States*,—it needs no eulogy here—which should have been forced upon the attention of every farmer and sportsman in the country, has lapsed into the position of a prize for the ornithological bibliophile! As such it now fails of useful service to any important degree.

On the other hand, there are popular magazines of wide circulation on whose pages may be seen advertisements of ammunition dealers, showily placed and attractively illustrated, calling upon the sportsman to go forth and shoot "hawks", propaganda that reach scores of people where there is one who ever hears a word on the other side. Audubon societies as a rule seem to have paid but scant attention to this phase of bird protection, the members thereof doubtless having for the most part but hazy notions of the true character of most predaceous birds; and Federal and state biologists have lately found all-engrossing occupation in the destruction of "noxious" animals—some of which used to be kept in bounds through the assistance of the formerly abundant Raptores. So, with most people lacking the knowledge to discriminate between harmful and beneficial species, usually in ignorance even that there are any useful kinds, and with the ever-present irresponsible gunner eager to shoot at such a mark, even should there be laws against doing so, the hawks suffer in consequence. For all of these reasons it is a pleasant privilege to call special attention to Mr. Taverner's excellent paper, and to urge the desirability of the broadcast distribution of reports such as this one is.—H. S. SWARTH.

MINUTES OF COOPER CLUB MEETINGS

NORTHERN DIVISION

AUGUST.—The regular meeting of the Northern Division of the Cooper Ornithological Club was held at the Museum of Vertebrate Zoology at 8 P. M., August 15, 1918. Dr. Evermann presided and the following members were present: Messrs. Carriger, Grinnell, Lastreto, Loomis, Noack, Swarth and Trenor; Mesdames Allen, Grinnell, Kluegel, Schlesinger; visitors, Miss Daniels, Miss Guthrie, Mr. Kelly, Mrs. Swarth, and Miss Hittell.

By special request the program preceded the business meeting. Mr. Leverett M. Loomis read an instructive paper on bird migration, in which he ascribed conflicting observations as due to reports of delayed migration rather than actual flight, and

discredited records pointing to a sixth sense as based upon such erroneous reports. General discussion was led by Dr. Grinnell.

The business of the evening was then disposed of. The minutes of the July meeting were read and approved, and the June and July minutes for the Southern Division were read. Mrs. G. E. Kelly was elected to membership, and Prof. H. E. McMinn, elected by the Southern Division, was approved for membership. The following names were presented: Miss Esther Guthrie, Woodland, California, by Mrs. J. T. Allen; Mrs. Harriette W. Bridges, Oakland, by Miss Margaret W. Wythe; Miss Isabel A. Thomson, Fallon, Nevada, by Mrs. Allen; Richard M. Hunt, Berkeley, by J. Grinnell; and J. W. Hungate, Cheney, Washington, by Barton W. Evermann and Walter P. Taylor.

A letter from Mrs. Florence Merriam Bailey to Dr. Grinnell, suggesting that the Cooper Club should have a place where note-books and photographs could be preserved, was read. Adjourned.—AMELIA S. ALLEN, *Secretary.*

SEPTEMBER.—The regular meeting of the Northern Division of the Cooper Ornithological Club was held at the Museum of Vertebrate Zoology, Berkeley, at 8 P. M., September 19, 1918. Dr. Evermann was in the chair and the following members were present: Messrs. Bryant, Carriger, Cooper, Evermann, Hunt, Lastreto, Loomis, Mailliard, Morley, Storer, Swarth, Wetmore and Wheeler; Mesdames Allen, Grinnell, Kluegel, Knappen, Meade and Schlesinger. The visitors present were Mrs. Wheeler, Mrs. Swarth and Mr. Schlesinger.

The minutes of the August meeting were read and approved. Miss Esther Guthrie, Woodland, Calif., Mrs. Harriette W. Bridges, Oakland, Miss Isabel Thomson, Fallon, Nevada, Richard M. Hunt, Berkeley, and J. W. Hungate, Cheney, Wash., were elected to membership. Mrs. E. D. Roe, San Francisco, was proposed for membership by Carl R. Smith, and Paul J. Fair, San Francisco, by Dr. Evermann.

An interesting letter from Mr. Ridgway describing early conditions in Indiana was read by Dr. Evermann.

Following up the suggestion made by Mrs. Florence Merriam Bailey, Mr. Swarth presented a motion that members of the Club be invited to deposit note-books or other records in the care of the Cooper Club. The motion was carried, as was also a motion offered by Mr. Mailliard that a committee of three be appointed by the Chair to arrange with the Southern Division as to the best place for keeping such material.

Mr. Mailliard reported a nighthawk as seen in San Francisco.

Mr. Alexander Wetmore then read an account of birds found at Lake Burford, northern New Mexico. He dwelt particularly upon water birds and especially upon their habits of display during the mating season.

At the close of the paper Dr. Evermann announced the committee to recommend place of deposit for ornithological records as follows: Mr. Joseph Mailliard, Mr. Harry S. Swarth and Mr. H. W. Carriger. Adjourned. —AMELIA S. ALLEN, *Secretary.*

OCTOBER.—Because of quarantine regulations, the regular October meeting of the Northern Division of the Cooper Ornithological Club was held under the trees outside the Museum of Vertebrate Zoology, the time being October 17, 1918, at eight o'clock. Dr. Evermann presided. The following members were present: Messrs. Bryant, Carriger, Hanford, Hunt, Kibbe, Loomis, Mailliard, Noack and Wheeler; Mesdames Allen, Bamford, Griffin, Kelley, Kibbe, Knappen and Meade. Visitors present were: Mrs. Morley, Mrs. Wheeler, Mr. Kelley and Mr. Meade.

The minutes of the September meeting were read and approved. Paul J. Fair, San Francisco, and Mrs. E. D. Roe, San Francisco, were elected to membership. Also S. Herbert Jones, F. B. Hart, Reginald Hopkins, John Mercer, Ernest Windle and O. H. Homme, whose names had already been passed upon by the Southern Division.

Resolutions relating to the proposed drainage of Malheur Lake for the benefit of real estate speculators, drawn up and signed by the Southern Division, copies of which were addressed to the U. S. Secretary of Agriculture, the Governor of Oregon, and the Land Board of Oregon, were read to the Club. By unanimous vote of the Club the Secretary was instructed to sign the resolutions for the Northern Division and to forward them to the proper parties.

Mr. Joseph Mailliard then gave an account of his visit to the Feather River country, with many interesting observations upon the songs, habits and nests of the birds found at different elevations.

After discussion and comparison of observations, the Club adjourned.—AMELIA S. ALLEN, *Secretary.*

SOUTHERN DIVISION

AUGUST.—The regular monthly meeting of the Southern Division, Cooper Ornithologi-

cal Club, was held at the Museum of History, Science and Art, August 29, 1918, at 8:00 P. M. In the absence of president and vice-president, Mr. Daggett was acclaimed chairman of the evening. Other members present were: Messrs. Barker, Brouse, Chambers, Colburn, Esterly, Hanaford, Holland, Law, Peyton, Robertson and Wyman; Mesdames Husher and Law. Mrs. Robertson was a visitor.

Minutes of the July meeting were read and approved. On proper motion the Secretary was instructed to cast an electing ballot for the parties whose names were presented at the July meeting. New names presented were: John D. Mercer, Los Angeles, by Fred Barker; Ernest Windle, Avalon, by A. B. Howell; and O. H. Homme, Pullman, Washington, by W. P. Taylor. Also, from the Northern Division, the names of Eva T. Griffin, San Francisco, and Elizabeth Ferguson, Berkeley, both presented by Mrs. J. T. Allen.

A notification, directed to one of the members personally, from the Biological Survey, to the effect that hereafter a special permit from the Department of Agriculture will be necessary for collecting migratory birds, was read to the Club. On motion by Mr. Chambers the secretary was instructed to secure a supply of blank applications for convenience of the members.

In the general discussion that followed Mr. Peyton, than whom none is more familiar with the haunts of the Condor, and who has collected extensively, oologically, among the eagles of Ventura County and the Santa Barbara Islands, told some of his experiences and observations. A tray of study-skins of Juncos and near-related sparrows received the usual attention. Adjourned.—L. E. WYMAN, *Secretary.*

NOVEMBER.—The regular monthly meeting of the Southern Division was held at the home of Mr. W. Lee Chambers, Eagle Rock, November 29, 1918, at 8:00 P. M. Members present were Messrs. Brown, Brouse, Chambers, Colburn, Dickey, Esterly, Law, Little, Nokes, Miller, Rich and Wyman, and Mrs. Law. President Miller officiated.

Minutes of the August and September meetings were read and approved, and those of the same meeting of the Northern Division were read. On proper motion the secretary was instructed to cast an electing ballot for the following parties, whose names were presented at previous meetings: H. L. Dillaway, Everett, Washington; John J. Furber, Klamath Falls, Oregon; Dr. Geo. W. Field, Washington, D. C.; Dr. L. E. Hibbard, Burns, Oregon; John D. Mercer, Los Angeles; Ernest Windle, Avalon; O. H. Homme, Pullman, Washington. The names of Maria V. Ballard, Eva T. Griffin, and Elizabeth Ferguson from the Northern Division, were approved.

New names presented were: A. L. Gormley, Arnprior, Ont., Canada, and Edward Gordon Alexander, Lexington, Mo., by W. Lee Chambers; Donald Still, Tucson, Ariz., by A. B. Howell; while the following were received from the Northern Division: Mrs. G. E. Kelly, Alameda; Richard M. Hunt, Berkeley; Mrs. Harriette W. Bridges, Berkeley; Miss Esther Guthrie, Woodland; and Miss Isabel A. Thomson, Fallon, Nevada.

Letters from Gov. Withycombe of Oregon, also from the Land Board of that state, and from the Secretary of Agriculture, Washington, D. C., acknowledging receipt of the Cooper Club's protest against the draining of Malheur Lake, Oregon, were read. The resignation of Mrs. Robert Fargo was presented and accepted.

A communication from the Northern Division was read, calling attention to the need of a Club repository for field notes. After some discussion, on motion by Mr. Law, seconded by Dr. Rich, and unanimously carried, it was expressed as the sense of the meeting that the Club's library be formally organized by the appointment of two librarians to be named, one each, from the active staff of the Museum of Vertebrate Zoology, Berkeley, and of the Museum of History, Science and Art, Los Angeles, and both to be members of the Cooper Ornithological Club. These librarians shall be the custodians of all publications, manuscripts, field notes, and other ornithological data given or bequeathed to the Club, and such material shall be deposited in the said two museums in such manner as to be available to scientific students, due regard being given to the expressed wishes of the respective donors. [This resolution is submitted now to the Northern Division.]

On motion of Dr. Rich, seconded by Mr Law, a vote of thanks was extended to Mr. and Mrs. Chambers for their hospitality in entertaining the Club and affording the opportunity for what was pronounced the most enjoyable meeting of the year.

In the half-hour of general discussion Mr. Law reported a nest, with two young, of the Green-backed Goldfinch, found on November 14. A session in Mr. Chambers' library, where many rare volumes were inspected, completed the meeting. Adjourned.—L. E. WYMAN, *Secretary.*

For Sale, Exchange and Want Column.—Any Cooper Club member is entitled to one advertising notice in each issue free. Notices of over ten lines will be charged for at the rate of ten cents per line. For this department, address W. LEE CHAMBERS, *Eagle Rock, Los Angeles County, California.*

WANTED—Auk, vols. 1 to 6, inclusive; Bird-Lore, vol. 1, nos. 2, 4; vol. 2, nos. 2, 3; vol. 3, nos. 1, 2, 3; vol. 19, complete. Offer cash or exchange. Wanted, one pair each of Harlequin Duck, Cinnamon Teal, Lesser Snow Goose, and any of the Eiders except American. *Offer water-fowl and other birds from this section, eggs in sets, and copies of The Birds of Virginia.*—HAROLD H. BAILEY, *Box 112, Newport News, Va.*

WANTED—A1 skins of the following: A. O. U. nos. 393a, 393b, 393e, 394, 412a, 474k, 474l, 484, 498b, 498c, 498g, 530, 540b, 552, 561, 588, 719, 721, 726a. Can offer in exchange: 430, 474m, 478a, 478e, 481, 499, 500, 518, 562, 581d (topotype), Sierra Fox Sparrow, 581h, 592.1.—JOSEPH MAILLIARD, *1815 Vallejo St., San Francisco, Calif.*

IF THE STATE NORMAL SCHOOLS are to do all they should in training their teachers to go into the schools of California prepared to give the best kind of bird study, they will need the help of Cooper Club members. I wish to send out such a call for the State Normal School at Chico. We shall appreciate gifts of any grade of skins, or information about available collections for purchase. —BERTHA CHAPMAN CADY, *State Normal School, Chico, California.*

WANTED—Ridgway's Birds of North and Middle America, vols. 1 and 3.—W. C. HANNA, 1000 *Pennsylvania Ave., Colton, Calif.*

HAVE you any good skins of birds from other countries to exchange for A1 specimens from North America, Japan and Australia; or can you refer me to any collector in foreign lands who will exchange?—HENRY K. COALE, *Highland Park, Ill.*

WILL EXCHANGE *full sets of the following:* A. O. U. nos. 52, 14, 71, 154, 157, 162, 114.1, 172a, 174. I want skins of any of the geese and swans, and of the Limicolae and Gallinae.—FRED L. GRANVILLE, 2238 *Canyon Drive,* Hollywood, Calif.

FOR SALE OR EXCHANGE—*Choice 4x5 and* 5x7 *prints of western birds, nests with eggs,* and young. Also large collection of wild flower photos. Write for list and prices.—H. J. RUST, *Box 683, Coeur D'Alene, Idaho.*

THE WARBLER—*Second series. Seven volumes complete, $3.50 post paid. Very few full sets left. Vols* 1 *and* 2, *with a dozen exquisite colored plates of rare birds eggs, is in good supply, and the two volumes will be mailed for* $1.00.—*J. L.* CHILDS, *Floral Park, N. Y.*

JOHN B. LITSEY, 7611 May St., Fort Worth, Texas, wants: One skin each of ♂ and ♀, A. O. U. nos. 239, 242 and 246, in winter plumage, taken in Mississippi Valley. Can offer choice sets.

I WANT a complete set or odd volumes of the Proceedings of the Biological Society of Washington Will give good exchange or cash.—W. LEE CHAMBERS, *Eagle Rock, Los Angeles County, California.*

I DESIRE good museum material with complete data. Birds, eggs, marine forms, etc. Can furnish any of the southern birds, and have a good series of ducks: Gadwall, Blue-winged Teal, etc.; also shorebirds, geese and herons. Address ALFRED M. BAILEY, *Louisiana State Museum, New Orleans, La.*

MEETINGS OF THE COOPER ORNITHOLOGICAL CLUB

Northern Division: 8 P. M., third Thursday of month, at Museum of Vertebrate Zoology, University of California, Berkeley. Take any train or car to University Campus. The Museum is the corrugated iron building on south side of campus just north of football bleachers.—MRS. AMELIA S. ALLEN, *Sec'y., 37 Mosswood Road, Berkeley, Calif.*

Southern Division: 8 P. M., last Thursday of month, at Museum of History, Science, and Art, Exposition Park, Los Angeles. Take "University" car south on Spring St., or "Vermont and Georgia" south on Hill. Get off at Vermont and Thirty-ninth, and walk two blocks east to Exposition Park. The Museum is the building with the large dome.—L. E. WYMAN, *Sec'y., care of Museum.*

Intermountain Chapter: Get date and place from the Sec'y., ASHBY D. BOYLE, *351 5th Ave., Salt Lake City, Utah.*

San Bernardino Chapter: Get date and place from the Sec'y., M. FRENCH GILMAN, *Banning, Calif.*

COOPER CLUB PUBLICATIONS

THE CONDOR

Vol.	I,	1899	"Bulletin of the Cooper Ornithological Club" - $.....
			No complete volume on hand; odd numbers only
Vol.	II,	1900	Complete, in parts as issued - - - - 8.00
Vol.	III,	1901	" " " " " - - - - - 8.00
Vol.	IV,	1902	" " " " " - - - - - 5.00
Vol.	V,	1903	" " " " " - - - - - 3.00
Vol.	VI,	1904	" " " " " - - - - - 3.00
Vol.	VII,	1905	" " " " " - - - - - 3.00
Vol.	VIII,	1906	" " " " " - - - - - 2.50
Vol.	IX,	1907	" " " " " - - - - - 2.50
Vol.	X,	1908	" " " " " - - - - - 2.50
Vol.	XI,	1909	" " " " " - - - - - 2.50
Vol.	XII,	1910	" " " " " - - - - - 2.50
Vol.	XIII,	1911	" " " " " - - - - - 3.00
Vol.	XIV,	1912	" " " " " - - - - - 2.00
Vol.	XV,	1913	" " " " " - - - - - 2.00
Vol.	XVI,	1914	" " " " " - - - - - 2.00
Vol.	XVII,	1915	" " " " " - - - - - 2.00
Vol.	XVIII,	1916	" " " " " - - - - - 2.00
Vol.	XIX,	1917	" " " " " - - - - - 2.00
Vol.	XX,	1918	" " " " " - - - - - 2.00
Vol.	XXI,	1919	(in progress) - - - - - - - 2.00
Vol.	XXII,	1920	(advance) - - - - - - - - 2.00
Vol.	XXIII,	1921	(advance) - - - - - - - 2.00

Odd numbers of any of above quoted on request.
Orders for advance volumes will be filled as issued.

PACIFIC COAST AVIFAUNA

No.	1,	1900	Birds of the Kotzebue Sound Region, Alaska; 80 pp., 1 map 75c By J. GRINNELL
No.	2,	1901	Land Birds of Santa Cruz County, California; 22 pp. - - 25c By R. C. McGREGOR
No.	3,	1902	Check-List of California Birds; 100 pp., 2 maps - - ..... By J. GRINNELL
No.	4,	1904	Birds of the Huachuca Mountains, Arizona; 75 pp. - - 50c By H. S. SWARTH
No.	5,	1909	A Bibliography of California Ornithology; 166 pp. - - $1.50 By J. GRINNELL
No.	6,	1909	Ten-Year Index to THE CONDOR; 48 pp. - - - - $2.00 By H. B. KAEDING
No.	7,	1912	Birds of the Pacific Slope of Southern California; 122 pp. $1.50 By G. WILLETT
No.	8,	1912	A Systematic List of the Birds of California; 23 pp. - - 50c By J. GRINNELL
No.	9,	1913	The Birds of the Fresno District; 114 pp. - - - - $1.50 By J. G. TYLER
No.	10,	1914	Distributional List of the Birds of Arizona; 133 pp., 1 map $1.50 By H. S. SWARTH
No.	11,	1915	A Distributional List of the Birds of California; 217 pp., 3 maps $3.00 By J. GRINNELL
No.	12,	1916	Birds of the Southern California Coast Islands; 127 pp., 1 map $1.50 By A. B. HOWELL
No.	13,	1919	Second Ten-year Index to THE CONDOR (in press) - ..... By J. R. PEMBERTON
No.	14,	1919	(in preparation) - - - - - - .....

For Sale by W. LEE CHAMBERS, Business Manager
Eagle Rock, Los Angeles Co., California